

**STORMWATER ORDINANCE  
OF  
GREENVILLE, SOUTH CAROLINA**

**EFFECTIVE DATE  
FEBRUARY 1, 2008**

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# **CITY OF GREENVILLE, SOUTH CAROLINA STORMWATER ORDINANCE**

## **INTRODUCTION**

This Ordinance is one part of the adopted Greenville, South Carolina Comprehensive Stormwater Management Plan. It sets forth the minimum requirements for the stormwater management in Greenville and the City as the corporate enforcement authority for the Ordinance. The purpose of this Ordinance is to allow management and mitigation of the effects of urbanization on stormwater drainage by consolidating the existing stormwater management framework into a uniform structure. The Greenville Comprehensive Stormwater Management Plan, adopted by Resolution on May 29, 2007 states, "... that the regulations be uniformly and consistently enforced throughout the City by all agencies."

## **ARTICLE I: AUTHORITY AND PURPOSE**

### **A. Authority**

The powers granted to the City of Greenville by the authority and directions for this Ordinance are contained in Act No. 194 of the Acts and Joint Resolutions of 1971 enacted by the general assembly of the state, approved April 23, 1971. In addition to the statutory authority provided for this division in general, the authority of this Ordinance arises from S.C. Code § 6-29-310 et seq. and is adopted pursuant to S.C. Code 1976, § 48-14-10 et seq., S.C. Code 1976, § 5-7-30, and South Carolina Land Resources Conservation Commission Regulations 72-300 through 72-316 and may be cited as the Stormwater Management Ordinance of the City of Greenville and is adopted pursuant to S.C. Code 1976, § 48-14-10 et seq., S.C. Code 1976, § 5-7-30, and South Carolina Land Resources Conservation Commission Regulations 72-300 through 72-316. The administration and enforcement of this Ordinance shall be designated by the City Manager in the Administrative Manual.

### **B. Purpose**

The purpose of this Ordinance is to establish reasonable rules and regulations for stormwater management in order to:

1. Prevent additional harm due to periodic flooding including loss of life and property and threats and inconveniences to public health, safety, welfare, and the environment.
2. Assure that development does not increase flood and drainage hazards to others, or create unstable conditions susceptible to erosion.
3. Create no new financial burden on the taxpayer for flood control projects, repairs to flood damaged public facilities and utilities, and for flood rescue and relief operations.
4. Protect, conserve and promote the orderly development while protecting and conserving the land and water resources.
5. Protect buildings and improvements to buildings from flood damage to the greatest extent possible.

6. Conserve the hydrologic, hydraulic, water quality and other beneficial functions of flood-prone areas and Regulatory Floodplains.
7. Prevent additional disruption of the economy and governmental services due to stormwater and flood drainage.
8. Maintain eligibility for the City of Greenville in the National Flood Insurance Program by equaling or exceeding its requirements and thus make federally subsidized flood insurance available at reduced rates. Comply with the rules and regulations of the National Flood Insurance Program codified as 44 CFR 59-79, as amended.
9. Maintain compliance with the provisions of the current, effective State of South Carolina NPDES General Permit for Storm Water Discharges from Regulated Small Municipal Separate Storm Sewer Systems, SC Water Pollution Control Regulations 61-9. Comply with the rules and regulations of the NPDES codified as 40 CFR 122-131, as amended.
10. Conserve and improve the natural hydrologic, hydraulic, water quality and other beneficial functions of wetlands by having, at a minimum, no net loss of wetlands in the City of Greenville, and further these beneficial functions of wetlands by having an objective of a 'net gain' or improvement of wetland function.

## **ARTICLE II: ORDINANCE ENFORCEMENT**

- A. One of the primary duties of the Administrator or designee shall be to review all stormwater applications and issue permits for those projects that are in compliance with the provisions of this Ordinance. The Administrator or designee shall be responsible for the administration and enforcement of the Ordinance.
- B. Included as part of this Ordinance as Appendix E is a delineation of requirements and duties required of and accepted by the Administrator or designee. Certain requirements or duties specified by FEMA and DHEC in Appendix E relate only to the intergovernmental relationship between a community and FEMA, South Carolina DNR, or DHEC for the purposes of that community obtaining or maintaining eligibility for the National Flood Insurance Program (NFIP) and Qualified Local Program Status.
- C. The Administrator or designee responsible for oversight of Stormwater Permits has the authority and responsibility to suspend a Designated Erosion Control Inspector's listing status for repeated or recurring non-compliance with Articles IV.B.1.i in this Ordinance. A notification of suspension from listing shall be issued to the Designated Erosion Control Inspector and copied to the applicant a minimum of 30 days prior to suspension from listing. Revocation of listing status shall be the responsibility of the City of Greenville per adopted procedure.

### **ARTICLE III: STORMWATER MANAGEMENT UTILITY**

A. The city council has made the following findings:

1. The management and regulation of stormwater runoff and sediment is necessary to reduce pollution, siltation, sedimentation, local flooding and stream channel erosion, all of which impact adversely on land and water resources and the health, safety, property and welfare of the residents of the city;
2. The city maintains a system of stormwater management facilities, including but not limited to inlets, conduits, manholes, outlets, ponds, and certain drainage easements;
3. The stormwater management facilities and components of the city need to be regularly maintained, rehabilitated, upgraded or improved, and additional stormwater management facilities and measures need to be installed throughout the city;
4. The city needs to upgrade its capability to maintain existing and future stormwater management facilities and measures;
5. All parcels of real property in the city, particularly those with improvements, both use or benefit from the stormwater management system and program; and the improvement of existing facilities and construction of additional facilities in the system will directly or indirectly benefit the owners of all real estate;
6. Continued growth in the city will contribute to the need for improvements in and maintenance and regulation of the stormwater management system;
7. The city can best manage and regulate the control of stormwater by a policy which regulates the use of real property, both private and public, and which takes reasoned, measured steps to involve the city in additional methods of participation and regulation;
8. Owners of real property should finance the stormwater management system to the extent they and the persons they permit to utilize their property contribute to the need for the system, and fees or other charges therefore should bear a substantial relationship to the cost of the service; and
9. It is in the best interests of the citizens of this city and, most specifically, the owners of real property, that a stormwater management utility and stormwater management utility fee system be established by ordinance and implemented as part of the city's utility special revenue fund, by whatever name designated.

B. Title of division; statutory authority.

This division may be cited as the Stormwater Management Ordinance of the City of Greenville and is adopted pursuant to S.C. Code 1976, § 48-14-10 et seq., S.C. Code 1976, § 5-7-30, and South Carolina Land Resources Conservation Commission Regulations 72-300 through 72-316.

C. Civil penalty.

Any person who violates any provision of this division shall be subject to a civil penalty of not more than \$1,000.00, or such additional maximum amount as may become authorized by state law, provided the owner or other person deemed to be in violation has been notified of a violation. Notice shall be deemed achieved when sent by regular United States mail to the last known address reflected on the county tax records, or such other address as has been provided by the person to the city. This provision is in

addition to the enforcement provisions of the City of Greenville, Code of Ordinances Chapter 19, Article I, Section 19-10.

D. Stormwater management utility established; administration; powers and duties.

1. The city council hereby establishes a stormwater management utility to carry out the purposes, functions and responsibilities set forth in this division. The governing body of the stormwater management utility shall be the city council. The Administrator shall administer the stormwater management utility through the public works department or such other departments and divisions as the city manager shall designate. The stormwater management utility shall have the following powers and duties, which powers and duties are not necessarily exclusive to the stormwater management utility:
  - a. Stormwater management planning and preparation of comprehensive watershed master plans for stormwater management.
  - b. Regular inspections and maintenance of public stormwater management facilities and measures for the construction thereof, as well as regular inspections of private stormwater management facilities.
  - c. Maintenance and improvements of stormwater management facilities that have been accepted by the city for purposes of stormwater management.
  - d. Plan review and inspection of sediment control and stormwater management plans, measures and practices.
  - e. Retrofitting designated watersheds to reduce existing flooding problems or to improve water quality.
  - f. Acquisition of interests in land, including easements.
  - g. Design and construction of stormwater management facilities and measures and acquisition of equipment.
  - h. Water quantity and water quality management, including monitoring surveillance.
  - i. Any and all powers and duties delegated or granted to it as a local government implementing agency under the laws and regulations of the state and the ordinances of the city.

E. Boundaries and jurisdiction.

The boundaries and jurisdiction of the stormwater management utility shall extend to the corporate limits of the city, as they may exist from time to time, and such areas lying outside the corporate limits of the city as shall be approved by the city council.

F. Amount and classifications of fees.

1. Criteria for establishing fees. The city council hereby establishes the amount and classifications of fees to be implemented to help fund the stormwater management utility and its programs and projects. In establishing such fees, the city council has considered, among other things, the following criteria:



- a. The fee system must be reasonable and equitable so that users pay to the extent they contribute to the need for the stormwater management utility, and so that fees or other charges bear a substantial relationship to the cost of service. The city council recognizes that these benefits, while substantial, in many cases cannot be measured directly.
- b. The components of the calculations used to establish fees must include, but may not be limited to, the following cost factors, which may be associated with the resolution of stormwater problems which the stormwater management utility shall seek to alleviate:
  - (1) Stormwater management planning and preparation of comprehensive watershed master plans for stormwater management;
  - (2) Regular inspection and maintenance of public stormwater management facilities and measures for the construction thereof, as well as regular inspections of private stormwater management facilities;
  - (3) Maintenance and improvement of stormwater management facilities that have been accepted by the city for purposes of stormwater management;
  - (4) Plan review and inspection of sediment control and stormwater management plans, measures and practices;
  - (5) Retrofitting designed watersheds to reduce existing flooding problems or to improve water quality;
  - (6) Acquisition of interests in land, including easements;
  - (7) Design and construction of stormwater management facilities and measures and acquisition of equipment;
  - (8) Administration and enforcement;
  - (9) Water quantity and water quality management, including monitoring surveillance; and
  - (10) Debt service and financing costs.
- c. The components of the calculations used to establish fees must be based on an equivalent residential unit (ERU), determined and approved by the city council, with reasonable general adjustments being made for, but not limited to, the following factors:
  - (1) Commercial, service and industrial land uses other than single-family residential;
  - (2) Open and/or forested land;
  - (3) Lot or tract size;
  - (4) The amount of site that is impervious; and

- (5) Other generally accepted factors relevant to such calculations based upon the provisions of this article.
  - d. The practical difficulties and limitations related to establishing, calculating and administering such fees should be addressed with due regard for fairness, efficiency, ease of comprehension, and ease of administration.
2. Fee structure. Stormwater management utility fees shall be fixed from time to time by the city council and are set forth in the fee schedule in Appendix D to this Code. Fee categories are as follows:
- a. Developed residential property. The fee structure for each parcel of developed residential property shall be allocated between two categories based on size of impervious area:
    - (1) Developed residential properties with an impervious area of 1,640 square feet or less; and
    - (2) Developed residential properties with an impervious area greater than 1,640 square feet.
  - b. Undeveloped residential property.
  - c. Developed multi-residential and nonresidential property.
  - d. Undeveloped multi-residential and nonresidential property
3. Review. The fee structure adopted may be reevaluated in three to five years for its fairness in implementation and its capacity to fund adequately, but not excessively, the needs of the program.
4. Adjustments. The city may provide a system of adjustments against stormwater management utility fees which can be applied to properties on which stormwater management facility construction, or other comparable provisions of construction or design of the premises, substantially mitigates the effect of stormwater runoff from the property on the city's stormwater management system or materially reduces the cost for the city to provide a system of stormwater management.

G. Determination of amount of impervious area.

The Administrator or designee will determine the amount of impervious area on each developed multi-residential and nonresidential property. A determination will be made using information derived from digital and other photographic data, as maintained by the Administrator or designee, commonly designated as Geographic Information System (GIS) data, and such additional information, if available, as may reliably supplement such data. Upon written request, an owner, or lawful occupant obligated to the owner for payment of the fee, shall be provided a written determination of the amount of impervious area for which a fee has been established.

H. Collection of fees.

- 1. Taxable property. The Administrator or his designee shall prepare and forward all information necessary to the county tax collector or his designee for the purpose of an annual billing of the stormwater management utility fee. Notice of

the fee shall be included on the property owner's notice of ad valorem real property taxes, and the fee shall be due and payable simultaneously with the taxes. By resolution, the council may authorize the city manager to implement other reliable means of billing.

2. Nontaxable property. The city council recognizes that nontaxable as well as taxable properties generate stormwater runoff and benefit from the stormwater management system and that the principle of fairness dictates that such properties be charged. The Administrator or his designee shall make arrangements for billing for nontaxable property in the same manner as taxable property. By resolution, the council may authorize the city manager to implement other reliable means of billing.
3. Date of imposition of fee for developed properties. Developed properties shall become subject to the imposition of the stormwater management utility fee at the billing cycle following final approval of site development by the city.

I. Use of revenue; investment of funds; borrowing.

Funds generated for the stormwater management utility from fees, bond issues, other borrowing and other sources shall be utilized only for those purposes for which the stormwater management utility has been established, including but not limited to regulation, planning, acquisition of interests in land, including easements, design and construction of facilities, maintenance of the stormwater management system, billing and administration, and water quantity and water quality management, including monitoring, surveillance, private maintenance inspection, construction inspection and other activities which are reasonably required. Such funds shall be invested and reinvested pursuant to the same procedures and practices established by the city for investment and reinvestment of funds. The city council may use any form of borrowing authorized by law to fund capital acquisitions or expenditures for the stormwater management utility. The city council, in its discretion and pursuant to standard budgetary procedures, may supplement such funds with amounts from the general fund.

J. Requests for reconsideration; appeals.

1. Request for reconsideration.

- a. A property owner of record, or a lawful occupant obligated to the owner for payment of the fee, may request a reconsideration of any determination or interpretation by the Administrator or designee in the operation of the stormwater management utility. Such request must be in writing and filed with the Administrator or designee, or such other person as the city manager may designate, within 30 days of receipt of notification of the determination or interpretation.
- b. The city shall review the application and make a decision on the request within 30 days of receipt of the request.
- c. The request shall be made upon such forms and be accompanied by such information as the city, by written policy, shall require.

2. Appeals.

- a. Persons who are authorized to make a request and who are aggrieved by a decision of the city under Article III, Section J.1 of this article shall

have the right to appeal to the city manager, or such person, committee or board as he may establish for such purpose.

- b. The appeal shall be in writing and shall set forth, in detail, the grounds upon which relief is sought. The person designated to review such appeal shall provide a hearing on the appeal within 30 days of filing and render a decision within 60 days of filing.
  - c. The person designated to review such appeal shall have full authority to affirm, modify or reverse a decision being reviewed upon determining whether the decision was made in compliance with the standards, policies and criteria of this division.
3. Payment of fee required. No provision of this division allowing for a request for reconsideration or for an administrative appeal shall be deemed to suspend the due date of the fee with payment in full. Any adjustment in the fee for the person pursuing a request for reconsideration or appeal shall be made by refund of the amount due.

K. Reserved.

## **ARTICLE IV: STORMWATER PERMITS**

### **A. General**

#### **1. Regulated Development**

No person, firm, corporation or governmental agency shall commence any development regulated by this Ordinance on any lot or parcel of land without first obtaining a Stormwater Permit from the City. A Permit shall be issued if the proposed development meets the requirements of this Ordinance. A Stormwater Permit is required for any development which:

- a. Is located in a Regulatory Floodplain; or
- b. Is located in a flood-prone area with 100-acres of tributary drainage area or more; or
- c. Is located in a depressional storage area with a storage volume of 0.75 acre-feet or more for the base flood; or
- d. Creates a wetland or riparian impact within an area defined as Waters of the U.S.; or
- e. Modifies the flood-prone area of a channel where the tributary drainage area is twenty (20) or more acres; or
- f. Includes the total land area of an ownership parcel, that results in:
  - (1) more than 1-acre of new impervious surface area; or
  - (2) more than 0.50 acres of hydrologically disturbed area, unless the total new impervious surface area is less than 0.25 acre; or
  - (3) An impervious surface area ratio of 40 percent or greater, unless the total new impervious surface area is less than 0.25 acre.

The term “new” in this article refers to impervious surface area created after the original effective date (February 1, 2008) of this Ordinance. Redevelopment of previously developed sites shall maintain existing storage volume and shall not increase the rate of runoff from the site. The applicant shall provide supporting data and calculations to the satisfaction of the Administrator or designee to ensure the site design either provides a watershed benefit or meets the requirements of Article IV, Section B.1.c.(3). New development on partially developed sites shall meet the release rate criteria in Article IV, Section B.1.c.(1) for the new development, if the new development exceeds the thresholds in Article IV, Section A.1.f. (1) or (2) or (3) above; or

- g. Any public road development resulting in one and one-half (1.5) acres or more of additional impervious surface per mile, for linear or nonlinear projects; or

- h. Any development which hydrologically disturbs 10,000 square feet or more. This development activity shall at a minimum meet the soil erosion and sediment control performance standards of Article IV, Section B.1.i, with associated application requirements. Public Road Development are required to meet the soil erosion and sediment control standards only for those projects which require permits according to Article IV, Section A.1.a.,b.,c.,d.,e.,g., above.

## 2. Exempted Development

All development shall meet the minimum state, federal and local regulations. No development is exempt from the floodplain, floodway, wetland and soil erosion and sediment control provisions of this Ordinance.

Upon review and verification by the Administrator or designee, that a. or b. below are met, the following are exempt from specific Ordinance performance standards:

- a. Annexation agreements, final plats, site development permits or current building permits approved prior to **February 1, 2008** if the stormwater management systems are installed, functioning and in compliance with all applicable stormwater regulations then in effect.
- b. Re-subdivision of commercial or industrial subdivisions identified under a. above, provided that the stormwater management systems are installed and functioning and there is no increase in impervious surface area permitted. Re-subdivision of commercial or industrial subdivisions identified under b. above, provided there is no increase in impervious surface area beyond that which was originally approved.

If eligible under a. or b. above, the applicant may submit a written request to the Administrator or designee for an exemption from specific performance standards of this Ordinance. The applicant's exemption request shall itemize each Ordinance provision that is requested for exemption.

## 3. Development Classification

All activities requiring a Stormwater Permit shall be classified as a minor, major, or public road development. The definition for each classification follows:

### a. Minor Development

A minor development is defined as any development that:

- (1) Is not located in a depressional storage area which has a volume larger than 0.75 acre-foot or is not located in any other portion of a Regulatory Floodplain; and
- (2) Does not create a wetland impact of one-tenth (1/10) or more acre; and
- (3) Modifies a channel where the tributary drainage area is less than 100 acres; and

- (4) Development that disturbs of less than two (2) acres requiring a Stormwater Permit

- b. Public Road Development

Any development activity which takes place in a public right-of-way or part thereof that is administered and funded, in whole or in part, by a public agency under its respective roadway jurisdiction. Rehabilitative maintenance and in-kind replacement are considered to be a public road development if located in a Regulatory Floodplain. A public road development located within a Regulatory Floodway and which has been approved by the South Carolina Department of Transportation is exempt from the hydraulic analysis requirements of this Ordinance. Individual recreation trail systems being constructed that are not part of another development project and linear railroad development projects shall be considered public road developments with respect to the requirements of this Ordinance.

- c. Major Development

A major development is defined as all other development.

- 4. Approvals Prior to Permitting

Prior to the issuance of a Stormwater Permit, the applicant may request a Conditional Approval or an Earth Change Approval.

- a. Conditional Approval

Conditional Approval for a development may be granted by the Administrator or designee. The Conditional Approval will be based on conformance with applicable performance standards and submittal requirements of this Ordinance. A letter will be sent to the applicant stating the results of the review and the conditions placed on any approvals.

- b. Earth Change Approval

If all the performance standards and application requirements in Article IV, Section B and C have been met, except for obtaining all the required local, state and federal approvals, a request for the commencement of grading activities may be made on a site prior to the issuance of a Stormwater Permit. The proposed grading activity may commence with written approval from the Administrator or designee of the earth change approval plan that delineates the activities specifically allowed. The written approval will state the conditions and limitations of the proposed grading activities. No development activity may occur in those portions of the site for which state and federal permits are required, except for DHEC sewer and water extension permits. Earth change approvals may not be granted for any development within a Regulatory Floodplain.

5. Permit Fees and Application Review Times

A schedule of fees in accordance with the provisions of this Ordinance shall be established by separate resolution of the City of Greenville. Such fees shall be paid at the time of application and prior to review of the application. Permit applications shall be reviewed within 20 business days of receipt of permit and associated permit fees. Amended permit applications shall be reviewed within 30 business days of receipt of permit and associated permit fees. The Administrator or designee shall approve, deny or provide remedial recommendations within 30 business days. If no action has been taken by the Administrator or designee within 60 days after receipt of an application, or within a longer time period if requested in writing by the applicant, the application shall be deemed denied.

6. Contiguous Property

In order to preclude inappropriate phasing of developments to circumvent the intent of this Ordinance, when a proposed development activity will occur on a lot or parcel of land that has contiguous lots or parcels of lands owned in whole, or in part, by the same property owner, then the criteria as defined in this article will be applied to the total land area compiled from aggregate ownership parcels. If this aggregate ownership parcel area is greater than the minimum area requirements defined in Article IV, Section A.1., then a Stormwater Permit will be required.

7. Permit Extensions and Terminations

Among the causes for terminating a permit during its term or for denying a permit extension include, but are not limited to, the following:

- a. Noncompliance with any condition of the permit; or
- b. The Permittee's failure to disclose fully all relevant facts in the application process or the Permittee's misrepresentation of any relevant facts at any time; or
- c. If the authorized work is not commenced within one (1) year after issuance of the permit, or if the authorized work is suspended or abandoned for a period of twelve months after the time of commencing the work, unless an extension has been granted in writing by the Administrator or designee. The extension should be requested of the Administrator or designee in writing no sooner than 90 days prior to the termination of the permit.

B. All Development

The following performance standards, application requirements and other provisions apply to all development requiring a stormwater permit. Subsequent sections include additional provisions for development in a Regulatory Floodplain, Wetland and public roads.



1. Performance Standards

a. Plats and Site Plans

- (1) The performance standards for all development (Article IV) shall be considered in site planning and appropriately addressed in the drainage plan component of subdivisions, annexation agreements, preliminary plats, final plats, re-plats, manufactured home parks and Planned Unit Developments (PUD).
- (2) In addressing Article IV, Section B.1.d "Runoff Volume Reduction Hierarchy" streets, blocks, lots, deed or plat restricted areas, parks and other public grounds shall be located and lined out in such a manner as to preserve and utilize natural streams, wetlands, and flood prone areas whenever possible.
- (3) Subdivisions, annexation agreements, plats, re-plats, manufactured home parks and PUDs shall show the base flood elevation (BFE) and Regulatory Floodway limits. The plats, re-plats, manufactured home parks, PUD, or engineering plans and studies shall include a signed statement by a Registered Professional Engineer that accounts for changes in the drainage of surface waters.
- (4) In areas outside the boundary of the Regulatory Floodplain, all usable space in new residential structures, or added to existing residential structures shall either be elevated, floodproofed, or other wise protected such that the low entry elevation shall be equal or greater than the Flood Protection Elevation to prevent the entry of surface stormwater. Floodproofing measures shall be certified by a Professional Engineer.
- (5) Stormwater management systems shall be functional before building permits are issued for residential and non-residential developments.
- (6) Soil erosion and sediment control measures and stormwater management systems shall be functional before general construction begins. Where development of a site is to proceed in phases, the soil erosion and sediment control measures and the stormwater management systems needed for each phase shall be functional before the construction of that phase begins.
- (7) The City's planning commission shall not approve any final PUD or Plat of subdivision located inside or outside the City of Greenville's corporate limits unless such PUD or Plat, at a minimum, meets the performance standards of the Stormwater Ordinance.
- (8) All stormwater management systems shall be located and described within a deed or plat restriction. Stormwater management systems that service a single parcel of property

may be excused from this requirement upon approval of the Administrator or designee.

- (9) Modifications to a deed or plat restriction for the stormwater management system shall be approved by the Administrator or designee.

b. Runoff Calculations

- (1) Design runoff rates shall be calculated using a City approved hydrograph-producing runoff calculation method as prescribed in the Technical Reference Manual.
- (2) Rainfall data as presented in Appendix G of this Ordinance shall be used for rainfall volume, storm distribution, return frequency and event duration
- (3) Runoff calculations for all off-site drainage may be based on anticipated future land use conditions or existing land use conditions. Anticipated future land use conditions will be based on future land use and existing storage facilities. Future detention facilities may be used for anticipated future land use conditions if approved by the Administrator or designee or for tributary drainage areas less than 100-acres. Existing land use conditions will be based on existing land use and existing storage facilities. For each frequency storm event, runoff calculations will be based on the critical duration, for all durations presented in Appendix G.
- (4) Existing depressional storage volume shall be maintained and the volume of detention storage provided to meet the requirements of this Ordinance shall be in addition to the existing storage.
- (5) For determination of soil runoff characteristics, areas of the development that are hydrologically disturbed and compacted shall be changed to that soil types' highest runoff potential/soil group classification. Conversely, soil groups that are not hydrologically disturbed will retain their current runoff characteristics, and areas that are deed or plat restricted for native planting areas may be determined to have lower runoff characteristics.

c. Release Rates and Discharges

- (1) Unless otherwise specified in Appendix H, a City of Greenville adopted basin plan or floodplain study, the detention volume required shall be calculated using a 24-hour storm event and release rates shall not exceed the 2-yr, 10-yr, and 25-yr pre-development release rates. The release rate requirement shall apply to the hydrologically disturbed area of the ownership parcel unless the Administrator or designee determines that specific locations of the development site have unique circumstances in which downstream capacity exists for receiving streams without sustaining damages. In such cases

the release rate may be adjusted to match downstream capacity. The release rate requirements shall only apply to developments listed in Article IV, Section A.1.f., and Article IV, Section A.1.g.

- (2) Watershed specific release rates are tabulated in Appendix H of this Ordinance.
- (3) Extreme flood and public safety protection shall be provided by controlling and safely conveying the 100-year, 24-hour storm event such that flood velocities are not exacerbated and flood elevations are not increased on adjacent properties.
- (4) All concentrated stormwater discharges must be conveyed into an existing channel, storm sewer, or overland flow path with adequate downstream stormwater capacity (as defined in Appendix A) and shall not result in increased flood and drainage hazard.
- (5) The design of stormwater management systems shall not result in the inter-basin transfer of drainage, unless no reasonable alternative exists. The Administrator or designee may also allow inter-basin transfers if the transfer relieves a known drainage hazard and there is adequate downstream stormwater capacity.
- (6) The combined release from the detention facility outlet and the outlet designed to meet wetland hydrology requirements shall not exceed the 25-year allowable release rate and shall meet the extreme flood protection and public safety protection standards as listed in Article IV, Section B.1.c(3). The wetland hydrology requirement or minimum outlet restrictor size may take precedence over the allowable release rate, provided there is adequate downstream capacity as determined by the Administrator or designee.
- (7) The applicant shall prohibit illicit discharges generated during the development process from entering into the stormwater management system. Discharges of stormwater from a development site shall be in conformance with the Soil Erosion and Sediment Control practices contained in Article IV.B.1.i of this Ordinance.

d. Runoff Volume Reduction Hierarchy

- (1) An applicant shall choose a strategy to meet the release rate requirement that minimizes the increase in runoff volumes and rates from the development and addresses the water quality treatment requirements in Article IV, Section B.1.g, of this Ordinance. The applicant shall use appropriate best management practices as presented in the Technical Reference Manual and the following hierarchy in preparing a drainage plan:

- (a) Preservation of natural resource features of the development site (e.g. floodplains, wetlands, natural vegetated areas and woodlands);
- (b) Preservation of the existing natural streams, channels and drainageways;
- (c) Minimizing impervious surfaces created at the site (e.g., narrowing road width, minimizing driveway length and width, clustering homes and shared driveways;
- (d) Preservation and enhancement of the natural infiltration and storage characteristics of the site (e.g., disconnection of impervious cover and on-lot bio-retention facilities);
- (e) The use of open vegetated channels to convey stormwater runoff;
- (f) Structural measures that provide water quality and quantity control;
- (g) Structural measures that provide only quantity control and conveyance.

e. Detention Facilities

- (1) All stormwater facilities, when determined applicable by the Administrator or designee, shall be provided with:
  - (a) An emergency overflow structure capable of passing the base flood inflow rate without damages to downstream structures or property.
  - (b) The top of the impounding structure shall be a minimum of one (1.0) foot above the design high water level within the emergency overflow structure based on (a) above.
  - (c) A minimum 8-foot wide safety shelf with a maximum depth of 3 feet below normal water level sloped back towards the shoreline.
  - (d) Features for maintenance and emergency ingress and egress capability.
- (2) Single pipe outlets shall have a minimum inside diameter of 12 inches. If design release rates call for smaller outlet, a design that minimizes the possibility of clogging shall be used. Minimum outlet restrictor size shall be four (4) inches in diameter provided there is adequate downstream capacity. Detention volume and corresponding high water level required for a development shall be determined by using the appropriate

release rates specified in Article IV, Section B.1.c, regardless of a minimum outlet restrictor size.

- (3) Stormwater infiltration, retention and detention facilities required to meet a development's discharge requirements shall be designed to by-pass offsite tributary flow from streams and channels unless approved by the Administrator or designee.
- (4) Any development involving the construction, modification or removal of a dam shall obtain from the South Carolina Department of Health and Environmental Control a Dam Safety Permit or a letter stating no permit required. Any permit from the US Army Corps of Engineers is required prior to the start of such activity.
- (5) Stormwater retention and detention facilities shall not be constructed in a Regulatory Floodplain unless approved by the Administrator or designee. If a retention or detention facility is constructed in a Regulatory Floodplain, the development must meet the requirements of Article IV, Section C, of this Ordinance.
- (6) On-Stream Detention
  - (a) All on-stream detention shall provide a Detention Volume Safety Factor as follows:
    - i. The Detention Volume Safety Factor applies to the volume of on-stream detention necessary to meet this Ordinance's site requirements.
    - ii. The Detention Volume Safety Factor is equal to one (1) plus 0.05 times the ratio of offsite tributary drainage area to on-site tributary drainage area.
    - iii. The maximum Detention Volume Safety Factor shall be 1.5.
  - (b) No on-stream detention shall be allowed with an off-site to on-site tributary drainage area ratio greater than 10:1 except for development providing a watershed benefit.
  - (c) On-stream detention shall not be permissible if the tributary drainage area is greater than 640-acres except for detention that provides a watershed benefit.
  - (d) The release rate shall not exceed the 2-yr, 10-yr, and 100-yr pre-development release rates of the total tributary drainage area (on-site and off-site) at the elevation created by impoundment of the on-site 100-year storm volume plus the Detention Volume Safety Factor and the required compensatory storage. The release rate and on-site detention volume shall be calculated using the 24-hour storm event. This release

rate calculation shall be used unless other site conditions warrant further analysis and modification from this standard or unless watershed specific release rates have been adopted.

- (e) Waters of the State shall not be used for permanent or temporary placement of water quality treatment devices.
  - (f) Impoundment of the stream as part of on-stream detention shall be designed to allow the migration and movement of present, previously present, or potentially present indigenous species, which require access to upstream areas as part of their life cycle. The impoundment shall not cause or contribute to the degradation of water quality or stream aquatic habitat.
  - (g) Compensatory Storage requirements shall be satisfied and shall be in addition to detention volume requirements.
  - (h) No on-stream detention shall be allowed in areas designated as a high quality aquatic resource.
- (7) The placement of a detention basin in a floodplain area shall require compensatory storage per Article IV, Section C.1.b.(7). The volume of detention storage required to meet the standards of this Ordinance shall be in addition to the floodplain compensatory storage required for the development.
- (8) Impounding berms or walls for stormwater retention and detention facilities shall be designed and constructed to withstand all expected forces, including but not limited to, erosion, pressure and uplift. The applicant shall submit material and compaction design specifications for earthen impoundments and provide as-built information verifying that the constructed condition meets the design requirements. Impounding berms or walls shall be represented on the design plans and signed and sealed by a Registered Professional or Structural Engineer.

f. Stormwater Conveyance Systems

(1) Storm Sewers and Swales

- (a) The 10-year design storm shall be used as a minimum for the design of storm sewers, swales and appurtenances. Storm sewers shall have a minimum diameter of 12 inches with the exception that storm sewers servicing a single parcel may be excused from this requirement upon approval of the Administrator or designee. Storm sewer design analysis shall be calculated under full flow conditions, unless prior approval from the Administrator or designee is received for an alternate flow condition (e.g., pressure flow).

- (b) Development shall not connect to sanitary sewers as an outflow for the stormwater management system.
- (c) All storm sewers shall be located in a public road right-of-way or provide a minimum of a 25 foot maintenance easement to maintain or re-construct the sewer.
- (d) All on-site stormwater conveyance systems shall be designed and constructed to withstand the expected velocity of flow from all events, up to the base flood, without erosion. Stabilization adequate to prevent erosion shall be provided at the inlets and outlets for all pipes, transitions and paved channels.
- (e) Swales being used as part of the stormwater management system for a development shall be located within a deed or plat restricted area of sufficient size to maintain or reconstruct the swale.
- (f) Surface outflows onto adjoining properties shall be designed to release as sheet flow using level spreader trenches, or equivalent unless alternative designs are approved by the Administrator or designee.

(2) Streams and Channels

The following items are general performance standards for streams and channels and do not excuse development from meeting all other requirements of this Ordinance.

- (a) Natural streams and channels are to be preserved and enhanced.
- (b) Removal of streamside (riparian) vegetation shall be avoided and minimized.
- (c) Clearing of channel vegetation shall be limited to that which is essential for construction of the channel.
- (d) If a stream or channel meeting the definition of Waters of the United States is modified, an approved permit from the US Army Corps of Engineers, in addition to a stream or channel mitigation plan shall be submitted for review and approval to the Administrator or designee. The plan shall show how the physical characteristics of the modified channel shall meet the existing channel length, cross-section, slope, sinuosity and carrying capacity of the original channel. The plan shall also re-establish vegetation within the channel modification using native plants for the re-vegetation plan.
- (e) All disturbed areas associated with a channel modification shall be seeded or otherwise stabilized immediately according to Article IV, Section B.1.i(1)(e).

- (f) If channels are modified, an approved and effective means to reduce sedimentation and degradation of downstream water quality must be installed before excavation begins and must be maintained throughout the construction period.
- (g) New or relocated channels shall be built in the dry and all items of construction, including vegetation, shall be completed prior to diversion of water into the new channel.
- (h) Streams and channels shall be expected to withstand all events up to the base flood without increased erosion. The armoring of banks using bulkheads, rip-rap and other materials shall be avoided. Armoring shall only be used where erosion cannot be prevented in any other way such as use of vegetation or gradual slopes. Such armoring shall have minimal impact on other properties, and the existing land configuration.
- (i) A minimum maintenance easement of 15-feet from top of bank is required along one side of all channels draining 20 or more acres. All drainage easements shall be accessible to vehicular equipment; however, linear accessibility for vehicular equipment is not required.
- (j) Construction vehicles shall cross streams by the means of existing bridges or culverts. Where an existing crossing is not available, a temporary crossing shall be constructed in which.
  - i. Water quality is maintained.
  - ii. The approach roads will be 0.5 feet or less above natural grade.
  - iii. The crossing will allow stream flow to pass without backing up the water above the stream bank vegetation line or above any drainage tile or outfall.
  - iv. The top of the roadway fill in the channel will be at least 2 feet below the top of the lowest bank. Any fill in the channel shall be non-erosive material, such as rip-rap or gravel.
  - v. All disturbed stream banks will be seeded or otherwise stabilized as soon as possible in accordance with Article IV, Section B.1.i(1)(e) upon installation and again upon removal of construction crossings.



- vi. The access road and temporary crossings will be removed within one year after installation, unless an extension of time is granted by the Administrator or designee.

(3) Overland Flow Paths

The following items are general performance standards for overland flow paths and do not excuse development from meeting all other requirements of this Ordinance.

- (a) All areas of development must be provided with an overland flow path that will pass the base flood flow without damage to structures or property. If the upstream drainage area is less than 20-acres, the storm sewer pipe and inlet systems sized for the base flood can be constructed in lieu of providing an overland flow path.
- (b) The flow rate for a base flood shall be used to establish overland flow path limits, and it shall include all on-site and off-site tributary areas in accordance with Article IV, Section B.1.b.
- (c) The overland flow paths shall be protected from any activity, such as fencing, landscaping, or storage shed placement, which could impair its function. This protection shall be established through a deed or plat restriction.
- (d) For overland flow paths with less than 20-acres tributary drainage area, all structures in parcels containing or adjoining to an overland flow path or other high water level designation shall have a lowest adjacent grade a minimum of one (1.0) foot above the design high water elevation.
- (e) For overland flow paths with greater than or equal to 20-acres tributary drainage area but less than 100 acres, all structures in parcels containing or adjoining to an overland flow path or other high water level designation shall have a lowest adjacent grade a minimum of two (2.0) feet above the design high water elevation.
- (f) Overland flow paths with greater than 100-acres tributary drainage area are considered to be flood prone areas.

g. Water Quality Treatment

- (1) The water quality treatment requirements of this Ordinance shall apply to any development within the total land area of the ownership parcel that result in creation of more than 0.25 acres

of new impervious area, where “new” is defined in Article IV Section A.1.f of this Ordinance.

- (2) Prior to discharging to Waters of the United States or adjoining property, all developments shall divert and detain at least the first 0.01 inches of runoff for every 1% of impervious surface for the development with a minimum volume equal to 0.5 inches of runoff (e.g., 50% impervious = 0.5”, 90% impervious = 0.9”); or provide a similar level of treatment of runoff as approved by the Administrator or designee and consistent with the Best Management Practices guidance contained in the Technical Reference Manual.
- (3) A buffer shall be established between design normal and high water levels around stormwater management facilities constructed for water quality treatment to enhance treatment effectiveness.
- (4) In addition to the requirements above, hydrocarbon (e.g., oil and grease) removal technology shall be required using a volume of 0.5 inches of runoff for the impervious surface tributary area to each treatment device and meeting a minimum 80% removal rate for all development classified as follows:
  - (a) Vehicle fueling and servicing facilities;
  - (b) Parking lots with more than 25 stalls.
  - (c) Car wash facilities that do not reclaim wash water.

h. Buffer Areas

- (1) Buffer areas shall be required for all Waters of the United States or stream classified as Waters of the State. Buffer areas are divided into two types, linear buffers and water body buffers.

“Waters of the United States” and “Waters of the State” are defined (Appendix A) in this Ordinance and refer to areas that are under the jurisdictional authority and regulated by the United States Army Corps of Engineers and the South Carolina Department of Health and Environmental Control respectively.

- (a) Linear buffers shall be designated along both sides of all channels meeting the definition of Waters of the United States or Waters of the State. The buffer width shall be determined as follows:
  - i. When the channel has a watershed greater than 20-acres but less than one square mile, the minimum buffer shall be 30 feet on each side of the channel.

- ii. When the channel has a watershed greater than one square mile, the minimum buffer shall be 50 feet on each side of the channel.
- (b) Water body buffers shall encompass all non-linear bodies of water meeting the definition of either Waters of the United States or Waters of the State. The buffer width shall be determined as follows:
  - i. For all water bodies or wetlands with a total surface area greater than one tenth (1/10) acre but less than one (1) acre, a minimum buffer width of thirty (30) feet shall be established.
  - ii. For all water bodies or wetlands with a total surface area greater than or equal to one (1) acre but less than two and one half (2 ½) acres, a minimum buffer width of forty (40) feet shall be established.
  - iii. For all water bodies or wetlands with a total surface area greater than or equal to two and one half (2½) acres, a minimum buffer width of fifty (50) feet shall be established.
- (2) Non-linear high quality aquatic resources shall have a minimum buffer width of seventy-five (75) feet.
- (3) In areas where state or federal threatened and endangered species are present, buffer widths shall be a minimum of one hundred (100) feet.
- (4) Buffer areas for water bodies meeting the definition of Waters of the United States or Waters of the State shall extend from the ordinary high water mark. Buffer areas for wetlands shall extend from the edge of the delineated wetland. A property may contain a buffer area that originates from Waters of the United States or Waters of the State on another property.
- (5) Features of the stormwater management system approved by the City may be within the buffer area of a development.
- (6) Access through buffer areas shall be provided, when necessary, for maintenance purposes.
- (7) All roadside drainage ditches, existing excavated detention facilities, existing borrow pits, existing quarries and improvements to existing public road developments or alignments are exempt from buffer requirements.
- (8) Stormwater discharges that enter a buffer shall have appropriate energy dissipation measures to prevent erosion and scour.

- (9) All buffer areas shall be maintained free from development including disturbance of the soil, dumping or filling, erection of structures and placement of impervious surfaces except as follows:
- (a) A buffer area may be used for passive recreation (e.g., bird watching, walking, jogging, bicycling, horseback riding and picnicking) and it may contain pedestrian, bicycle or equestrian trails.
  - (b) Structures and impervious surfaces (including trails, paths) may occupy a maximum of twenty (20) percent of the buffer surface area provided the runoff from such facilities is diverted away from the Waters of the United States or Waters of the State or such runoff is directed to enter the buffer area as un-concentrated flow.
  - (c) Utility maintenance, construction of stormwater facilities and maintenance of stormwater facilities shall be allowed.
  - (d) Boat docks, boathouses and piers shall be allowed and the provisions of (9) (b) above shall apply.
  - (e) Buffer areas hydrologically disturbed by allowing construction or as part of a re-vegetation plan shall be re-vegetated using native vegetation.
- (10) A minimum of a five-foot temporary construction buffer from the limits of the Waters of the United States or Waters of the State shall be required. The five-foot temporary construction buffer shall be marked by construction fencing and installed prior to the start of all other construction activities. All other construction activities, including soil erosion and sediment control features, shall take place on the non-wetland side of the construction fencing.
- (11) Buffer Averaging: The buffer width for a development site may be varied to a minimum of  $\frac{1}{2}$  of the buffer width required, upon approval of the Administrator or designee, provided that the total buffer area required is achieved adjacent to the Waters of the United States or Waters of the State being buffered.
- (12) Preservation of buffer areas shall be provided by deed or plat restrictions.
- (13) The buffer area of a development site may be subtracted from the water quality volume required.

i. Soil Erosion and Sediment Control

- (1) Soil erosion and sediment control related measures are required to be constructed and maintained for any land

disturbance activity permitted under Article IV, Section A. The following requirements shall be met:

- (a) Soil disturbance shall be conducted in such a manner as to minimize erosion. Areas of the development site that are not to be graded shall be protected from construction traffic or other disturbance until final seeding is performed. Soil stabilization measures shall consider the time of year, site conditions and the use of temporary and/or permanent measures.
- (b) Properties and channels adjoining development sites shall be protected from erosion and sedimentation. At points where concentrated flow leaves a development site, energy dissipation devices shall be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity of flow from the structure to the watercourse so that the natural physical and biological characteristics and functions are maintained and protected.
- (c) Soil erosion and sediment control features shall be constructed prior to the commencement of hydrologic disturbance of upland areas.
- (d) Disturbed areas shall be stabilized with temporary or permanent measures within fourteen (14) calendar days following the end of active hydrologic disturbance, or redisturbance, consistent with the following criteria or using an appropriate measure as approved by the Administrator or designee.
  - i. Appropriate temporary or permanent stabilization measures shall include seeding, mulching, sodding, and/or non-vegetative measures.
  - ii. Areas or embankments having slopes greater than or equal to 4H:1V shall be stabilized with staked in place sod, mat or blanket in combination with seeding.
  - iii. Erosion control blanket shall be required on all interior detention basin side slopes between normal water level and high water level.
  - iv. The fourteen (14) day stabilization requirement may be precluded where construction activity will resume within 21 days from when the active hydrologic disturbance ceased, then stabilization measures do not have to be initiated on that portion of the site by the 14<sup>th</sup> day after construction activity temporarily ceased given that portion of the site has appropriate soil erosion and sediment controls.

- (e) Land disturbance activities in streams shall be avoided, where possible. If disturbance activities are unavoidable, the following requirements shall be met:
  - i. Approved permits from the US Army Corps of Engineers will be submitted to the Administrator or designee.
  - ii. Where stream construction crossings are necessary, temporary crossings shall be constructed of non-erosive material.
  - iii. The time and area of disturbance of a stream shall be kept to a minimum. The stream, including bed and banks, shall be re-stabilized within 48 hours after channel disturbance is completed or interrupted.
- (f) Soil erosion and sediment control measures shall be appropriate with regard to the amount of tributary drainage area as follows:
  - i. Disturbed areas draining greater than 1000-ft<sup>2</sup> but less than 1-acre shall, at a minimum, be protected by a filter barrier (including filter fences, which at a minimum, meet the applicable sections of the AASHTO Standard Specification 288-00, or equivalent control measures) to control all off-site runoff. Vegetated filter strips, with a minimum width of 25-feet, in the direction of flow, may be used as an alternative only where runoff in sheet flow is expected.
  - ii. Disturbed areas draining more than 1 but fewer than 5-acres shall, at a minimum, be protected by a sediment trap or equivalent control measure at a point down slope of the disturbed area.
  - iii. Disturbed areas draining more than 5-acres, shall, at a minimum, be protected by a sediment basin with a perforated filtered riser pipe or equivalent control measure at a point down slope of the disturbed area.
  - iv. Sediment basins shall have both a permanent pool (dead storage) and additional volume (live storage) with each volume equal to the runoff amount of a 2-year, 24-hour event over the on-site hydrologically disturbed tributary drainage area to the sediment basin or 3600 cubic feet per acre drained. The available sediment volume below normal water level, in addition to

the dead storage volume shall be sized to store the estimated sediment load generated from the site over the duration of the construction period. For construction periods exceeding 1-year, the 1-year sediment load and a sediment removal schedule shall be submitted.

If the detention basin for the proposed development condition of the site is used for sediment basin, the above volume requirements will be explicitly met. Until the final site stabilization is complete, the basin permanent pool of water shall meet the above volume requirements and have a filtered perforated riser protecting the outflow pipe.

- (g) All storm sewers that are or will be functioning during construction shall be protected by appropriate sediment control measure.
- (h) If dewatering services are used, adjoining properties and discharge locations shall be protected from erosion. Discharges shall be routed through an effective sediment control measure (e.g., sediment trap, sediment basin or other appropriate measure).
- (i) All temporary soil erosion and sediment control measures shall be removed within 30 days after final site stabilization is achieved or after the temporary measures are no longer needed. Trapped sediment and other disturbed soil areas shall be permanently stabilized or properly disposed of.
- (j) A stabilized mat of aggregate underlain with filter cloth (or other appropriate measure) shall be located at any point where traffic will be entering or leaving a construction-site to or from a public right-of-way, street, alley or parking area. Any sediment or soil reaching an improved public right-of-way, street, alley or parking area shall be removed by scraping or street cleaning as accumulations warrant and transported to a controlled sediment disposal area. The Administrator or designee may require additional stabilized construction entrance methods.
- (k) Earthen embankments shall be constructed with appropriate stabilization and side slopes no steeper than 4H:1V. Steeper slopes may be constructed with appropriate stabilization as approved by the Administrator or designee.
- (l) Stormwater conveyance channels including ditches, swales, and diversions, and the outlet of all channels and pipes shall be designed and constructed to withstand the expected flow velocity from the 10-year

frequency storm without erosion. All constructed or modified channels shall be stabilized within 48-hours of disturbance.

- (m) Temporary diversions shall be constructed as necessary to direct all runoff from disturbed areas to the appropriate sediment trap or basin.
  - (n) Soil stockpiles shall not be located in a flood-prone area or a designated buffer protecting Waters of the United States or Waters of the State. Soil stockpiles are defined as having greater than 100 yd<sup>3</sup> of soil and will remain in place for more than 7 days. Soil stockpile locations shall be shown on the soil erosion and sediment control plan and shall have the appropriate measures to prevent erosion of the stockpile.
  - (o) Handbooks: Standards and specifications contained in *The South Carolina DHEC Storm Water Management BMP Field Manual* and the *Technical Reference Manual*, as amended are referenced in this Ordinance as guidance for presenting soil erosion and sediment control plan specifications and delineating procedures and methods of operation under site development for soil erosion and sediment control. In the event of conflict between provisions of said manuals and this Ordinance, this Ordinance shall govern.
  - (p) The applicant shall provide adequate receptacles for the deposition of all construction material debris generated during the development process. The applicant shall not cause or permit the dumping, depositing, dropping, throwing, discarding or leaving of construction material debris upon or into any development site, channel, Waters of the United States or Waters of the State. The applicant shall maintain the development site free of construction material debris.
  - (q) Soil erosion and sediment control measures shall at a minimum achieve an equivalent removal efficiency of 80 percent for suspended solids or 0.5 ML/L peak settleable solids concentration, whichever is less. The efficiency shall be calculated for disturbed conditions for the 10-year 24-hour design event.
- (2) Designated Erosion Control Program Standards
- (a) A Designated Erosion Control Inspector, hired by the applicant, is required for all development that exceeds 10 acres of hydrologic disturbance or exceeds 1 acre of hydrologic disturbance and has a Regulatory Floodplain, Waters of the United States or Waters of the State on-site or on adjoining property.



- (b) Article VI of this Ordinance contains inspection requirements for development meeting the above threshold for program inclusion and Designated Erosion Control Inspector requirements.
- (c) The applicant shall submit the name of the Designated Erosion Control Inspector to the Administrator or designee at or before the pre-construction meeting or commencement of hydrologic disturbance for the development.
- (d) The Administrator or designee shall be notified of a permanent change in the Designated Erosion Control Inspector within 14 days of the change.

## 2. Application Requirements

All the following application requirements shall be submitted when applicable to the development as determined by the Administrator or designee.

### a. Application Requirements for Minor Developments

- (1) A completed Stormwater Permit application signed by the applicant or applicant's agent, and when required, a Professional Engineer.
- (2) A general description of the existing and proposed stormwater management system including all discharge points, collection, conveyance, and storage facilities.
- (3) A grading plan showing proposed and existing contours, record drawings, and other required drawings shall be prepared, signed, and sealed by a land surveyor or professional engineer and tied to the North American Vertical Datum of 1988.
- (4) A site drainage plan which depicts drainage features, overland flow paths, stormwater management system components, flood-prone areas, Regulatory Floodplains, wetland boundaries, buffer areas, existing septic systems and wells. A capacity analysis of the above stormwater management system components may be required by the Administrator or designee.
- (5) An area drainage plan locating the proposed development in the watershed.
- (6) A description and depiction of measures to be taken to control erosion. (soil erosion and sediment control plan)
- (7) A description of the anticipated dates of initiation and completion of activity.
- (8) Provide an exhibit(s) for review which displays all deed or plat restrictions of record or to be recorded for the stormwater management system.

- (9) The federal, state and local permit requirements of Article IV Section B.2.b (13) [NOI] are required when applicable to the development site, and Article IV Section B.2.b (9) [maintenance plan] and (10) [PE seal] shall be required.
- (10) A wetland submittal if required under Article IV Section C.3 of this Ordinance.
- (11) Information regarding any endangered species or endangered species habitat on the project site must be submitted.

b. Application requirements for Major Developments

In addition to the requirements for minor developments, major development applications require the following information:

- (1) Name and legal address of the applicant, and common address of the location where the development will take place, mailing address of the property owner and the signature of the applicant or the applicant's agent and a Professional Engineer.
- (2) A topographic map of the existing conditions of the development site showing the location of all roads, all drainageways, the boundaries of predominate soil types, the boundaries of predominate vegetation, and the location of any drainage easements, detention or retention basins, including their inflow and outflow structures, if any. The map shall also include the location, size, and flow line elevations of all existing storm or combined sewers and other utility lines within the site. The map shall be prepared using a 2-foot or less contour interval and shall be prepared at an appropriate scale for the type of project and shall include specifications and dimensions of any proposed channel modifications, location and orientation of cross-sections, if any, north arrow, and a graphic or numerical scale. Record drawings, and other required drawings shall be prepared, signed, and sealed by a land surveyor or professional engineer and tied to the North American Vertical Datum of 1988.
- (3) Include cross-section views for the stormwater management system showing existing and proposed conditions including principal dimensions of the work, and existing and proposed elevations, normal water and calculated base flood elevations, and overland flow depth and path. The elevations of lowest floor or lowest adjacent grade for structures shall be included on the development plan as applicable. Refer to the Ordinance sections on 'Overland Flow Paths' (Article IV Section B.1.f (3)), and floodplain 'Building Protection Requirements' (Article IV Section C.1.b (9)), for elevation requirements of structures within or adjacent to flood prone areas.
- (4) A vicinity map shall be included along with the Parcel Identification Numbers of all parcels comprising the proposed development.

- (5) A report describing the hydrologic and hydraulic analysis performed for the project. The report shall include the name of stream or body of water affected, a Jurisdictional Determination approved by the US Army Corps of Engineers, a statement of purpose of proposed activity, and a detailed determination of the runoff for the project site under existing and developed conditions. This includes documentation of the design volumes and rates of the proposed runoff for each portion of the watershed tributary to the stormwater management system and receiving channel and high water elevations. Runoff calculations shall include all discharges entering the site from upstream areas.
- (6) A section in the hydrologic and hydraulic analysis report describing how the Runoff Volume Reduction Hierarchy clauses (as described in Article IV, Section B.1.d.) were evaluated in designing and determining the stormwater management needs of the site.
- (7) For detention facilities, a section in the hydrologic and hydraulic analysis report that includes a plot or tabulation of storage volumes and water surface areas with corresponding water surface elevations, stage-discharge or outlet rating curves, and design hydrographs of inflow and outflow for the 2-year, 10-year, and 100-year, 24-hour storm events under existing and developed conditions.
- (8) A soil erosion and sediment control plan showing all measures appropriate for the development as approved by the Administrator or designee, to meet the objectives of this Ordinance throughout all phases of construction and permanently after completion of development of the site. Guidance regarding appropriate methods, procedures, controls measures, and implementation will be provided in the Technical Reference Manual, but shall at a minimum include:
  - (a) Location and description, including standard details, of all sediment control measures and design specifics of sediment basins and traps, including outlet details. The drainage area tributary to each sediment control measure shall be delineated on the soil erosion and sediment control plan.
  - (b) Location and description of all soil stabilization and erosion control measures, including seeding mixtures and rates, types of sod or vegetation, method of seedbed preparation, expected seeding dates, type and rate of lime and fertilizer application, kind and quantity of mulching for both temporary and permanent vegetative control measures, and types of non-vegetative stabilization measures.
  - (c) Location and description of all runoff control measures, including diversions, waterways, and outlets.

- (d) Location and description of methods to prevent tracking of sediment off-site, including construction entrance details, as appropriate.
- (e) Description of dust and traffic control measures.
- (f) Locations of stockpiles and description of stabilization methods.
- (g) Description of off-site fill or borrow volumes, locations, and methods of stabilization.
- (h) Provisions for maintenance of control measures, including type and frequency of maintenance, easements, and estimates of the cost of maintenance.
- (i) Identification (name, address, and telephone) of the person(s) or entity which will have legal responsibility for maintenance of erosion control structures and measures during development and after development is completed.
- (j) A written narrative description of the proposed phasing (construction sequencing) of development of the site, including stripping and clearing, rough grading and construction, and final grading and landscaping. Phasing should identify the expected date on which clearing will begin, the estimated duration of exposure of cleared areas, and the sequence of installation of temporary sediment control measures (including perimeter controls), clearing and grading, installation of temporary soil stabilization measures, installation of storm drainage, paving streets and parking areas, final grading and the establishment of permanent vegetative cover, and the removal of temporary measures. It shall be the responsibility of the applicant to notify the Administrator or designee of any significant changes that occur in the site development schedule after the initial soil erosion and sediment control plan has been approved.
- (k) Bonds: The applicant may be required to file with the Administrator or designee a faithful performance bond or bonds, letter of credit, or other improvement security satisfactory to the Administrator or designee in an amount deemed sufficient by the Administrator or designee to cover all costs of improvement, landscaping, maintenance of improvements and landscaping, and soil erosion and sediment control measures for such period as specified by the Administrator or designee, and engineering and inspection costs to cover the cost of failure or repair of improvements installed on the site.

- (9) A maintenance plan for the ongoing maintenance of all stormwater management system components, including wetlands, is required prior to plan approval. The plan shall include:
- (a) Maintenance tasks.
    - i. The party responsible for performing the maintenance tasks.
    - ii. A description of all permanent public or private access deed or plat restricted areas for all stormwater management system components for the development.
    - iii. A description of dedicated sources of funding for the required maintenance.
    - iv. Measures to prohibit the dumping, depositing, dropping, throwing, discarding or leaving of litter and construction material debris and all other illicit discharges into the stormwater management system and measures to be in continued compliance with effective SC DHEC NPDES.
- (10) The Application form, development plans, and stormwater reports shall meet the requirements of this Ordinance and shall be signed and sealed by a Registered Professional Engineer.
- (11) Public trail and park facility projects that do not involve the placement of structures or fill can be submitted without the certification or seal of a Registered Professional Engineer.
- (12) A description of the anticipated dates of initiation and completion of activity.
- (13) For all development sites requiring a National Pollutant Discharge Elimination System (NPDES) permit, the applicant shall submit a Notice of Intent to comply with the NPDES Permit. The approved soil erosion and sediment control plan created pursuant to the requirements of this Ordinance shall fulfill the plan requirements in the NPDES permit.
- (14) If the soil mapping submitted for the development indicates the presence of hydric soils, then the applicant shall provide site specific soil mapping performed by a certified soil classifier for the development. No buildings shall be constructed on these soils unless appropriate building methods, such as pilings, caissons or removal and replacement of unsuitable soils, as approved by the Administrator or designee, are used to provide and protect a suitable building foundation.
- (15) A wetland submittal if required under Article IV Section C.3 of this Ordinance.

- (16) Information regarding any endangered species or endangered species habitat on the project site must be submitted.
- c. The applicant shall obtain and provide a copy of a South Carolina Dam Safety Permit or a letter stating that a Dam Safety Permit is not required if the development includes a dam before the applicant requests or obtains a Stormwater Permit.
- d. The applicant shall obtain and provide copies of any and all required federal and state permits for in the Regulatory Floodplain before the applicant requests or obtains a Stormwater Permit. Reference Appendix F for a partial list of permits that may be applicable.
- e. The applicant shall submit the data required to the City and FEMA for proposed revisions to the base flood elevation of a Regulatory Floodplain study or relocation of a Regulatory Floodway boundary.
- f. Upon completion of development, record drawings of the site stormwater plan shall be submitted to the City. Such drawings shall be prepared, signed, and sealed by a land surveyor or professional engineer and shall include calculations showing the "as-built" volume of compensatory and site-runoff storage. If the record drawings deviate from the approved plans, the land surveyor or professional engineer shall certify that the facility meets the regulatory standards.
- g. The applicant shall provide, when applicable to the development: an affidavit or documentation to prove where the development was above the base flood elevation (BFE) prior to the effective date of the first Regulatory Floodplain map; certification that the ground elevation existed prior to the effective date of the first Regulatory Floodplain map.

C. Special Management Areas

1. Regulatory Floodplains and Regulatory Floodways

- a. Location of Regulatory Floodplain, base flood elevation (BFE) and Regulatory Floodway
  - (1) The Regulatory Floodplain is delineated within a development by projecting the BFE onto the site topography.
  - (2) The BFE shall be as delineated by the 100-year flood profiles, as indicated on the floodplain studies noted below;
    - (a) City of Greenville Floodplain Studies, adopted by the City Council for regulatory use after receiving an Independent Technical Review and a 60-day public technical review and comment period. Approved Greenville floodplain studies, maps and profiles shall be posted on the City of Greenville website. Greenville floodplain studies, including maps and profiles, shall be effective where:

- i. The elevations exceed the current effective Flood Insurance Study (FIS) maps and profiles, provided that the study has been submitted to FEMA for approval; or
  - ii. The base flood elevation had not previously been determined in the current effective FIS.
- (b) Should no City of Greenville approved Regulatory Floodplain profile exist for the site, the FEMA Flood Insurance Study and profiles apply, as listed in Appendix C.
- (c) In the case of FEMA delineated "AH Zones" the elevation noted on the map shall be the BFE. In the case of FEMA delineated "AO Zones" the BFE shall be the depth number shown on the map added to the highest adjacent grade, or at least two feet above the highest adjacent grade if no depth number is provided.
- (d) When no base flood elevation exists, the BFE shall be determined by a Registered Professional Engineer using an appropriate model or technique as approved by the City or FEMA. For riverine flood-prone areas with greater than 100-acres of tributary drainage area, non-riverine flood-prone areas with greater than 20-acres of tributary drainage area, and all mapped Special Flood Hazard Areas regardless of drainage area, the BFE determination shall be submitted to the City for approval prior to issuance of a Stormwater Permit. The BFE determination for non-riverine depressional floodplains with less than 20-acres of tributary drainage area shall be reviewed and approved by the Administrator or designee. BFE determinations shall be based on the critical duration event.
  - i. Where a channel has a tributary drainage area of 640-acres or more, the above analyses shall be submitted to the City for approval.
  - ii. For a non-riverine Regulatory Floodplain, the historic flood of record (as determined by the Administrator or designee) above plus four feet may be used for the BFE instead of performing a detailed hydrologic and hydraulic study.
- (3) The location of the Regulatory Floodway shall be as delineated on the maps referenced in Appendix C. Where Interpretation is needed to determine the exact location of the Regulatory Floodway boundary, the City should be contacted.
- (4) Nothing contained herein shall prohibit the application of these regulations to land that can be demonstrated by engineering survey to lie within any Regulatory Floodplain. Conversely, any lands (except for those located in a Regulatory Floodway) that

can be demonstrated by a topographic survey certified by a Registered Professional Engineer or Registered Land Surveyor to lie beyond the Regulatory Floodplain, and show to the satisfaction of the Administrator or designee, to have been higher than the BFE as of the effective date of the first floodplain mapping denoting the site to be in a Special Flood Hazard Area, shall not be subject to the regulations of this section upon receipt of a Letter Of Map Amendment (LOMA) from FEMA.

In the case of a site located in the Regulatory Floodway that is higher than the BFE, it is subject to the regulations of this section until such time as a Letter Of Map Revision (LOMR) is received from FEMA.

b. Performance Standards Applicable to all Regulatory Floodplain Development

The standards of this section apply to all Regulatory Floodplain development except when superseded by more stringent requirements in the subsequent sections.

- (1) Modification and disturbance of natural riverine Regulatory Floodplains shall be avoided to protect existing hydrologic and environmental functions. Such disturbances shall be minimized and all negative impacts mitigated as described in a mitigation plan.
- (2) No development shall be allowed in the Regulatory Floodplain that shall singularly or cumulatively create a damaging or potentially damaging increase in flood heights or velocity or damages or threat to public health, safety and welfare or impair the natural hydrologic or hydraulic functions of the Regulatory Floodplain or channel.
- (3) For all projects involving channel modification, fill, stream maintenance, or levees, the flood carrying capacity of the Regulatory Floodplain shall be maintained.
- (4) Zones AH and AO require the identification of adequate drainage paths around structures on slopes, to guide floodwaters around and away from proposed structures.
- (5) All adjacent property owners, communities, and the South Carolina Department of Natural Resources shall be notified prior to any alteration or relocation of a floodplain, and submit copies of such notifications to the City.
- (6) Public Facilities shall be constructed so as to minimize flood damage.
- (7) Compensatory storage is required for all storage lost or displaced in a Regulatory Floodplain due to development.



- (a) Hydraulically equivalent compensatory storage requirements for fill or structures in a riverine Regulatory Floodplain shall be at least equal to 1.5 times the volume of Regulatory Floodplain storage lost or displaced. Such compensation areas shall be designed to drain freely and openly to the channel and shall be located opposite or adjacent to fill areas. A deed or plat restriction is required to prohibit any modification to the compensation area. The Regulatory Floodplain storage volume lost below the existing 10-year frequency flood elevation must be replaced below the proposed 10-year frequency flood elevation. The Regulatory Floodplain storage volume lost above the 10-year existing frequency flood elevation must be replaced above the proposed 10-year frequency elevation.
- (b) Hydraulically equivalent compensatory storage requirements for fill or structures in a non-riverine Regulatory Floodplain shall be at least equal to 1.2 times the volume of Regulatory Floodplain storage lost or displaced. Non-riverine floodplain storage may be replaced at or below the existing elevation but not below the Normal Water Level.
- (c) Upon approval of the Administrator or designee, shorelines or streambanks that have experienced erosion may be restored to their condition as of the effective date of the first FIRM in that community without the need to provide compensatory storage for the fill used to restore the eroded area according to the following criteria:
  - i. The restoration fill shall meet existing grades. Within riverine areas the current effective Regulatory Floodplain and Regulatory Floodway conveyance shall be maintained.
  - ii. The amount of eroded property being restored shall be documented and submitted by the applicant as part of the permit process. Proper documentation shall be either field survey information or photo documentation of the erosion that has occurred for the property being restored.
  - iii. For rivers, lakes and streams where no floodway has been designated, no documentation of past shoreline erosion is required if the applicant does not exceed 1 cubic yard of fill per lineal foot for a maximum of 300 feet. In this case, the placing of the fill shall not significantly alter the alignment of the shoreline with adjoining properties as determined by the Administrator or designee.

Non-documentable fills are a one-time allowance on a per property basis and all fills exceeding 300 cubic yards shall be regulated as specified in Articles IV Article B.1.f and IV Section C.1.b (7) of this Ordinance.

iv. Replacement of banks shall be stabilized to withstand the 10-year flood event.

(d) Top dressing is the placement of not more than four (4) inches of topsoil within the Regulatory Floodplain for the purposes of stabilizing an existing erosion control problem or establishing vegetative cover. Topdressing shall be allowed by permit on a per-parcel, one-time only allowance, and not impact adjoining property drainage patterns. Upon approval of the Administrator or designee, floodplain compensatory storage shall not be required. Top dressing fill shall comply with the Soil Erosion and Sediment Control standards and Wetlands Provisions of this Ordinance (Article IV.B.1.i. and Article IV Section C.3). This provision shall not be applicable to the design process for new development.

(8) Public Health Protection Standards

(a) For property within the Regulatory Floodplain, no chemicals, petroleum (hydrocarbon) products, explosives, buoyant materials, animal waste, fertilizers, herbicides, flammable liquids, pollutants, or other hazardous or toxic materials shall be placed or stored below the Flood Protection Elevation.

(b) New and replacement water supply systems, wells, and sanitary sewer lines may be permitted providing all manholes or other above-ground openings located below the Flood Protection Elevation (FPE) are watertight.

(c) On-site waste disposal systems shall be designed to avoid inundation by the base flood.

(9) Building Protection Requirements

(a) All structures shall be constructed by methods and practices that minimize flood damages.

(b) The lowest floor including basements of all new residential structures shall be elevated up to at least the Flood Protection Elevation (FPE). An attached garage for a new structure must be elevated up to at least one foot above the base flood elevation (BFE).

i. If placed on compacted fill, the top of the fill for residential structure shall be above the FPE. The top of fill for an attached garage shall be

one foot above the BFE. The fill pad shall be placed at the appropriate elevation and designed to extend a minimum of 10-feet out from the building's designed footprint unless the building is certified by a Registered Structural Engineer to be protected from damages due to hydrostatic pressures. Additionally, the fill pad shall meet 95% of Standard Proctor Density in order to be demonstrated not to settle below the FPE for the residential structure and not below one foot above the BFE for an attached garage, and to be adequately protected against erosion, scour and differential settlement. Foundation excavations shall not extend more than 5-feet beyond the foundation footprint. Backfill for the over excavated area does not need to meet the compaction requirements.

- ii. If elevated by means of walls, pilings, or other foundation, the building's supporting structure must be permanently open to flood waters and not subject to damage by hydrostatic pressures of the base flood. The permanent openings shall be no more than one foot above lowest adjacent grade and below the BFE, and consist of a minimum of two openings. The openings must have a total net area of not less than one square inch for every one square foot of enclosed area subject to flooding below the BFE. The foundation and supporting members shall be anchored and aligned in relation to flood flows and adjoining structures so as to minimize exposure to known hydrodynamic forces such as current, waves, ice and floating debris. All areas below the FPE shall be constructed with flood-resistance materials. The lowest floor (including basement) for the residential structure and all electrical, heating, ventilation, plumbing, and air conditioning equipment and utility meters shall be located at or above the FPE. An attached garage must be elevated to at least one foot above the BFE. Water and sewer pipes, electrical and telephone lines, submersible pumps and other waterproofed service facilities may be located below FPE. The area less than one foot above the BFE may be used for parking and access but shall not be used for storage of items or materials.
- (c) The lowest floor, including basements, of an existing residential structure with a substantial improvement shall be elevated in order to be not less than one foot above the BFE. The lowest floor including the basements of all substantially improved non-residential

buildings shall be elevated or structurally dry flood-proofed, per Article IV Section C.1.b (9), to a minimum of one foot above the BFE. The structural design requirements in Article IV Section C.2.b (9) (b) i. and ii. shall also apply to this section.

- (d) The lowest floor including the basements of all new non-residential buildings shall be elevated at least to the FPE in accordance with Article IV Section C.2.b (9) (b) i. and ii. or be structurally dry flood-proofed to at least the FPE. A non-residential building may be structurally dry flood-proofed (in lieu of elevation) provided that a Registered Professional Engineer or Registered Structural Engineer shall certify that the building has been structurally dry flood-proofed below the FPE and the structure and attendant utility facilities are watertight and capable of resisting the effects of the base flood. The building design shall take into account flood velocities, duration, rate of rise, hydrostatic and hydrodynamic forces, the effects of buoyancy and impacts from debris or ice. Flood-proofing measures shall be operable without human intervention and without an outside source of electricity. (Levees, berms, floodwalls and similar works are not considered flood-proofing for the purpose of this subsection.)
- (e) Manufactured homes, substantially improved manufactured homes, and recreational vehicles to be installed on a site for more than 180 days shall be elevated to or above the FPE and shall be anchored to resist flotation, collapse, or lateral movement in accordance with Section 19-425.39 of the *South Carolina Manufactured Housing Board Regulations*, effective date May 25, 1990, as amended. Additionally, when the elevation requirement would be met by an elevation of the chassis at least 36 inches or less above the grade at the sight, reinforced piers or other foundation elements of at least equivalent strength shall support the chassis. When the elevation of the chassis is above 36 inches in height an engineering certification is required.
- (f) Tool sheds, detached garages, and attached garages which are not substantial improvements on an existing single-family platted lot, may be constructed with the lowest floor below the FPE in accordance with the following:
  - i. The building shall not be used for human habitation.
  - ii. All areas below the BFE shall be constructed with flood-resistant material. Structures located outside a Regulatory Floodway shall be constructed and placed on a building site so as

not to block the flow of flood waters and shall also meet the Appropriate Use criteria of Article IV, Section C.3.c. In addition, all other requirements of this Ordinance must be met.

- iii. The structure shall be anchored to prevent flotation, collapse or lateral movement.
  - iv. Service facilities such as electrical and heating equipment shall be elevated or flood-proofed to the FPE.
  - v. The building shall be valued at less than \$3,000.00.
  - vi. The building shall be used only for the storage of vehicles or tools and may not contain other rooms, workshops, greenhouses or similar uses.
- (g) A non-conforming structure damaged by flood, fire, wind or other natural or man-made disaster may be restored unless the damage meets or exceeds fifty percent (50%) of its market value before it was damaged, in which case it shall conform to the above provisions of Article IV, Section C.1.b (9).
- (h) If the proposed development would result in a change in the mapped Regulatory Floodplain, Regulatory Floodway, or the BFE on a site, the applicant shall submit sufficient data to the City and FEMA to obtain the appropriate Letter of Map Change (LOMC).
- (i) Any work involving construction or modification or removal of a dam or an on-stream structure to impound water shall obtain a South Carolina Department of Health and Environmental Control Dam Safety Permit, a US Army Corps of Engineers permit, or letters indicating permits are not required prior to the start of development activity.
- (j) If flood-proofing construction is required beyond the outside dimensions of an existing habitable, residential or commercial building, the outside perimeter of the flood-proofing construction shall be placed no further than 10-feet from the outside of the building. Compensation of lost storage and conveyance will not be required for flood-proofing activities.
- (k) For public flood control projects, the permitting requirements of Article IV, Section C.1 and 2. will be considered met if the applicant can demonstrate to FEMA through hydraulic and hydrologic calculation that the proposed project will not singularly or cumulatively result in increased flood heights outside the project

right-of-way or easements for all flood events up to and including the base flood event.

- (l) Critical Facilities shall be elevated at a minimum to the 0.2 percent chance flood (500-year) elevation or the highest known historical flood elevation (where records are available), which ever is greater. If no data exists, establishing the 0.2 percent change flood elevation or the highest known historical flood elevation, the applicant shall provide a hydrologic and hydraulic engineering analysis that generates the 0.2 percent change flood elevation data.

c. Additional Performance Standards for the Regulatory Floodway

The only development in a Regulatory Floodway which will be allowed are Appropriate Uses which will not cause an increase in flood heights for all flood events up to and including the base flood. Appropriate uses do not include the construction or placement of any new structures, fill, building additions, buildings on stilts, fencing (including landscaping or planting designed to act as a fence) and storage of materials except as specifically defined below as an Appropriate Use. If the development is proposed for the Regulatory Floodway portion of the Regulatory Floodplain the following standards apply in addition to the previously stated standards for the Regulatory Floodplain:

- (1) Only the construction, modification, repair or replacement of the following Appropriate Uses will be allowed in the Regulatory Floodway:
  - (a) Public flood control projects and private improvements relating to the control of drainage, flooding of existing buildings, erosion, water quality or habitat for fish and wildlife;
  - (b) Structures or facilities relating to functionally water dependant uses such as facilities and improvements relating to recreational boating and as modifications or additions to existing wastewater treatment facilities;
  - (c) Storm and sanitary sewer outfalls;
  - (d) Underground and overhead utilities sufficiently flood-proofed;
  - (e) Recreational facilities such as playing fields and trail systems including any related fencing (at least 50% open when viewed from any one direction) built parallel to the direction of flood flows, and including open air pavilions;
  - (f) Bridges, culverts and associated roadways, sidewalks and railways, necessary for crossing over the Regulatory Floodway or for providing access to other

Appropriate Uses in the Regulatory Floodway and any modification thereto;

- (g) Parking Lots
    - i. Parking Lots (where the existing depth of flooding for the base event is less than one foot) and aircraft parking aprons both built at or below ground elevation and any modifications thereto.
    - ii. The depth of flooding can be greater than one (1) foot for parking lots used for short term outdoor recreational use facilities where the applicant agrees to restrict access during overbank flooding events and agrees to accept liability for all damages caused by vehicular access during all overbank flooding events.
  - (h) Regulatory Floodway re-grading, without fill, to create a positive non-erosive slope toward a channel.
  - (i) Flood-proofing activities to protect previously existing lawful structures including the construction of water-tight window wells, elevating structures, or the construction of flood walls around residential, commercial or industrial principal structures where the outside toe of the floodwall shall be no more than ten (10) feet away from the exterior wall of the existing structure, and, which are not considered to be substantial improvements to the structure.
  - (j) The replacement, reconstruction or repair of a damaged building, provided that the outside dimensions of the building are not increased and, provided that the building is not damaged to 50% or more of the building's market value before it was damaged. When damage is 50% or more, the activity shall conform to Article IV, Section C.1.b (9).
  - (k) Modifications to an existing building, which are not substantial improvements, that would not increase the enclosed floor area of the building below the base flood elevation, and which will not block flood flows including but not limited to, fireplaces, bay windows, decks, patios, and second story additions. No enclosed floor areas may be built on stilts.
- (2) All Appropriate Uses shall require a permit from the City and must be in accordance with all provisions of this Ordinance.
  - (3) Construction of an Appropriate Use will be considered permissible provided that the proposed project meets the following engineering and mitigation criteria and that of Article IV, Section C.1 and is so stated in writing with supporting plans,

calculations and data prepared by a Registered Professional Engineer.

- (a) All effective Regulatory Floodway conveyance lost due to the development of Appropriate Uses, other than bridge or culvert crossings or on-stream structures or dams, shall be replaced for all flood events up to and including the base flood. In calculating effective Regulatory Floodway conveyance, the following factors shall be taken into consideration:

- i. Regulatory Floodway conveyance,

$$K = (1.486/n) AR^{2/3}$$

where “n” is Manning’s roughness coefficient, “A” is the effective area of the cross-section, and “R” is the ratio of the area to the wetted perimeter.

- ii. The same Manning’s n-value shall be used for both existing and proposed conditions unless a recorded maintenance agreement with a federal, state, or local unit of government can ensure the proposed conditions will be maintained or the land cover is changing from a vegetative to a non-vegetative land cover.

- (b) Transition sections shall be provided and used in calculations of effective Regulatory Floodway conveyance, in the design of excavations in the Regulatory Floodway, between cross-sections with rapid expansions and contractions, and when meeting the Regulatory Floodway delineation on adjoining properties. The following expansion and contraction ratios shall be used:

- i. Water will expand no faster than at a rate of one-foot horizontal for every four-feet of the flooded stream’s length.
  - ii. Water will contract no faster than at a rate of one-foot horizontal for every one-foot of the flooded stream’s length.
  - iii. Water will not expand or contract faster than one-foot vertical for every ten-feet of flooded stream length.
  - iv. All cross-sections used in the calculations shall be located perpendicular to flood flows.
  - v. In the design of excavations in the Regulatory Floodway, erosion/scour protection shall be



provided on land upstream and downstream of proposed transition sections.

- (c) The development of all Appropriate Uses shall not result in an increase in the average channel or Regulatory Floodway velocities or stage, for all flood events up to and including the base flood event. However, in the case of bridges or culverts or on stream structures built for the purpose of backing up water in the stream during normal or flood flows, velocities may be increased at the structure site if scour, erosion and sedimentation will be avoided by the use of appropriate design measures.
- (d) In the case of on-stream structures built for the purpose of backing up water, an increase in upstream stage when compared to existing conditions for all flood events up to and including the base flood event shall be contained within recorded easements. A permit or letter indicating a permit is not required must be obtained from SC DHEC Dam Safety Section for a Dam Safety permit and the US Army Corps of Engineers; or waiver for any structure built for the purpose of backing up water in the stream during normal or flood flow.
- (e) General criteria for analysis of flood elevations.
  - i. The flood profiles, flows and Regulatory Floodway data in the Regulatory Floodway study, referenced in Article IV, Section C.1.c, must be used for analysis of the base conditions. If the study data appears to be in error or conditions have changed the City shall be contacted for approval and concurrence on the appropriate base conditions data to use.
  - ii. If the BFE at the site of the proposed development is affected by backwater from a downstream receiving stream with a larger drainage area, the proposed development shall be shown to meet the requirements of this section for the base elevations of the Regulatory Floodway conditions and conditions with the receiving stream at normal water elevations. Additional receiving stream elevations may be considered for design if appropriate and approved by the City.
  - iii. If the applicant is informed by local governments, or a private owner that a downstream or upstream restrictive bridge or culvert is scheduled to be removed, reconstructed, modified, or a regional flood control project is scheduled to be built, removed, constructed or modified within the

next five years, the proposed development shall be analyzed and shown to meet the requirements of this section for both the existing conditions and the expected flood profile conditions when the bridge, culvert or flood control project is built.

- (f) If the Appropriate Use will result in a change in the Regulatory Floodway location or a change in the BFE the applicant shall submit to the City the information required to be issued a Conditional Letter of Map Revision (CLOMR) from FEMA. The application will not be considered complete until the CLOMR is received. No filling, grading, dredging or excavating shall take place until a conditional approval is issued by the Administrator or designee. The construction or placement of structures within the currently effective floodway boundary shall not take place until a final Letter of Map Revision (LOMR) is issued by FEMA, which revises the floodway boundary.
- (4) For those circumstances listed below and located in a Regulatory Floodway, the following information shall be submitted to the City:
  - (b) Analysis of the flood profile due to a proposed bridge, culvert crossings and roadway approaches.
  - (c) An engineer's determination that an existing bridge or culvert crossing or approach road is not a source of flood damage and the analysis indicating the proposed flood profile.
  - (d) Alternative transition sections and hydraulically equivalent storage.
- d. Special Considerations for the Construction of New Bridges or Culvert Crossings and Roadway Approaches or the Reconstruction or Modification of Existing Bridges, Culvert Crossings or Roadway Approaches.
  - (1) A proposed new structure shall not result in an increase or decrease of upstream or downstream flood stages greater than 0.1-foot when compared to the existing conditions for all flood events up to and including the base flood event. If the proposed new structure would result in a change in the upstream or downstream flood stages, the applicant shall submit sufficient data to the City and FEMA to obtain the appropriate Letter of Map Change (LOMC).
  - (2) Lost Regulatory Floodway storage must be compensated for per the Regulatory Floodplain performance standards of this Ordinance except that artificially created storage that is lost or displaced due to a reduction in upstream head loss caused by a bridge, culvert, storm sewer or constructed embankment shall

not be required to be replaced, provided no flood damage will be incurred downstream.

- (3) Velocity increases must be mitigated per the Regulatory Floodway performance section of this Ordinance except that in the case of bridges or culverts or on stream structures built for the purpose of backing up water in the stream during normal or flood flows, velocities may be increased at the structure site if scour, erosion and sedimentation will be avoided by the use of appropriate measures.
- (4) If the structure is a source of flood damage, the applicant's engineer shall submit justification to allow the damage to continue and evaluate the feasibility of relieving the structure's impact. Modifications or replacement structures shall not increase flood stages compared to the existing condition for all flood events up to and including the base flood event.
- (5) The hydraulic analysis for the backwater caused by the bridge showing the existing condition and proposed regulatory profile must be submitted to the FEMA for concurrence that a Conditional Letter of Map Revision (CLOMR) is not required.

e. Regulatory Floodplains without Regulatory Floodways

The applicant, through the City, shall obtain approval from FEMA for all development with a tributary drainage area of 640-acres or more located within the Regulatory Floodplain without a delineated Regulatory Floodway. The development shall not singularly or cumulatively result in an obstruction of flood flows or potential flood damages outside the development due to increased flood heights, velocities, or loss of floodplain storage. The applicant shall meet the requirements of Article IV, Section C.1 of this Ordinance according to the following criteria:

- (1) Submit to the City an engineering study performed by a Registered Professional Engineer which will determine a floodway which meets the definition of a Regulatory Floodway and show that the proposed development will meet the requirements of Article IV, Section C.1 of this Ordinance; or
- (2) Submit to the City an engineering study performed by a Registered Professional Engineer which will determine a base flood elevation and demonstrate that the proposed development will maintain the existing conditions conveyance, will not increase flood velocities, will not increase flood profiles, and will compensate for all lost flood storage at a ratio of 1.5:1 in a manner that is hydraulically equivalent; or
- (3) Submit to the City an engineering study performed by a Registered Professional Engineer which will demonstrate that for a range of flood elevations (which would conservatively exceed the expected 100-year flood elevation) that the proposed development will maintain the existing conditions conveyance, will not increase flood velocities, will not increase

flood profiles, and will compensate for all lost flood storage at a ratio of 1.5:1 in a manner that is hydraulically equivalent.

f. Application Requirements for Development in the Regulatory Floodplain.

If the development is located in a Regulatory Floodplain, the applicant shall provide the following additional information:

- (1) Site location of the property, drawn to scale on the Regulatory Floodplain map.
- (2) A plan view of the project showing:
  - (a) The Regulatory Floodway limit, Regulatory Floodplain limits and for work in public bodies of water as defined by SC DNR, the US Army Corps of Engineers, or the navigation channels.
  - (b) Cross-section views of the project for the impacted reach showing existing and proposed conditions including principal dimensions of the work as shown in plan view, existing and proposed elevations, normal water elevation, 10-year frequency flood elevation, 100-year frequency flood elevation, and graphic or numerical scales (horizontal and vertical).
  - (c) A copy of the Regulatory Floodway map with the project site delineated and marked to reflect any proposed change in the Regulatory Floodway location.
- (3) A listing of all local, state and federal permits or approval letters that may be required for this type of development. The applicant shall obtain and provide copies of any and all required federal, state and local permits for development in the Regulatory Floodplain before the applicant requests or obtains a Stormwater Permit. Reference Appendix F for a partial list of permits that may be applicable.
- (4) Engineering calculations and supporting data (including model inputs and outputs) showing that the proposed work will meet the performance standards of this Ordinance.
- (5) All changes in grade resulting from any proposed excavation or filling; and existing and proposed Regulatory Floodplain and Regulatory Floodway limits; the location and dimension of all buildings and additions to buildings; and the elevation of the lowest floor (including basement) of all proposed buildings subject to the requirements of this Ordinance.
- (6) Elevation Certificate of the lowest floor elevation (including basements and attached garages) or the elevation to which a non-residential building has been flood-proofed using a flood-proofing certificate for all buildings in the Regulatory Floodplain.

## 2. Flood-Prone Areas

The standards of this section apply to development located in flood-prone areas with drainage areas less than 640 acres or in depressional storage areas, as specified.

### a. Flood-carrying Capacity

The flood-carrying capacity shall be maintained for channels with flood-prone areas draining a tributary area of 20 acres or more. (Article IV, Section B.1.f).

### b. Flood-prone Area Conveyance, Velocities, Flood Profiles, and Flood Storage

For all development within a flood-prone area where the tributary drainage area is 100 acres or more, the applicant shall meet the requirements of Article IV, Sections C.1.b (7) and (8) of this Ordinance according to the following criteria:

- (1) Submit to the City an engineering study performed by a Registered Professional Engineer which will determine a floodway which meets the definition of a Regulatory Floodway and show that the proposed development will meet the requirements of Article IV, Section C.1 of this Ordinance; or
- (2) Submit to the City an engineering study performed by a Registered Professional Engineer which will determine a Base Flood Elevation and demonstrate that the proposed development will maintain the existing conditions conveyance, will not increase flood velocities, will not increase flood profiles, and will compensate for all lost flood storage at a ratio of 1.5:1 in a manner that is hydraulically equivalent; or
- (3) Submit to the City an engineering study performed by a Registered Professional Engineer which will demonstrate that for a range of flood elevations (which would conservatively exceed the expected 100-year flood elevation) that the proposed development will maintain the existing conditions conveyance, will not increase flood velocities, will not increase flood profiles, and will compensate for all lost flood storage at a ratio of 1.5:1 in a manner that is hydraulically equivalent.

## 3. Wetland Provisions

In order to insure no net loss of the City's wetland resources, the following provisions are required when 0.1 or more cumulative acres of wetland are impacted. All impacts to jurisdictional waters of the US must be done in cooperation with all Federal and State standards.

### a. Wetland Performance Standards

- (1) The applicant shall delineate all wetland area boundaries in accordance with the current federal wetland determination methodology.

- (2) The following hierarchy will be observed by all applicants to determine application requirements:
  - (a) The proposed project will avoid adverse impacts to the greatest extent possible based on consideration of hydrologic conditions, existing topography, vegetation and human activity as it relates to stormwater management.
  - (b) The proposed project will minimize the adverse impacts to the greatest extent possible based on consideration of hydrology conditions, water quality, existing topography, vegetation and human activity as it relates to stormwater management.
  - (c) If there are wetland impacts, selection of the appropriate mitigation option will be based on a functional assessment provided by the applicant.
- (3) Mitigation is required for all permanent adverse impact to wetlands that result despite attempts to avoid and/or minimize. The following criteria shall be met to offset the wetland impacts:
  - (a) The mitigation plan shall include all appropriate measures to be carried out to maintain or improve the functions of wetlands, mitigate adverse environmental impacts, restore vegetation and land and water features, prevent sedimentation and erosion, minimize the area of wetland disturbance and ensure compliance with other provision of this Ordinance and federal and state guidelines.
  - (b) The mitigation plan will occur on-site unless the functional assessment indicates that the functions can be better reproduced off-site.
  - (c) Depending on the circumstances under which wetlands are lost or disturbed, the Administrator or designee in conjunction with the U.S. Army Corps of Engineers when appropriate, will determine which of the following mitigation options is appropriate:
    - i. Restoration: Restoration refers to actions performed on a site that reverse or remedy adverse impacts.
    - ii. Enhancement: Enhancement refers to actions performed to improve the functionality of an existing, degraded wetland.
    - iii. Creation: Creation refers to the creation of new wetlands on a non-wetland site.

- iv. Contribution: Contribution refers to the donation of land or money to a City approved Wetland Mitigation Bank.
- (d) Mitigation standards shall be determined by function replacement. The replacement of lost wetland functions, as identified in the functional assessment report shall be at a minimum equal to those previous to disturbance. The minimum land area ratio shall be 1.5 acres mitigated to every 1.0 acre lost. A higher ratio may be required when the probability of success of replacing the lost function warrants it, or when required by the US Army Corps of Engineers.
- (e) All plants used in the mitigation shall be native to the up-state region.
- (f) Performance standards shall be established before application and included in the mitigation plan. The permittee shall successfully implement the approved mitigation plan or component within the time period required by the Administrator or designee.
- (g) Mitigation must be performed prior to or concurrently with activities that will permanently disturb wetlands.
- (4) Wetlands may be used for on-site stormwater detention subject to the following:
  - (a) It must be demonstrated that the use of the wetland for detention will maintain or improve the wetland's beneficial functions.
  - (b) Existing depressional storage in wetlands shall be maintained and the volume of detention storage provided to meet the requirements of the Ordinance shall be in addition to the existing storage.
  - (c) No high-aquatic resource wetlands based upon their functional assessment shall be used for satisfying on-site detention requirements.
  - (d) This use of wetlands must be approved by the US Army Corps of Engineers.
- (5) Monitoring shall be utilized to insure the establishment of the mitigation and that it meets the standards of this Ordinance. In order to achieve this criterion, the following standards shall be met:
  - (a) The permittee shall submit an annual monitoring report for up to ten years from the completion of the construction of the mitigation project. As part of the final report the permittee shall provide information justifying that monitoring is no longer required. The wetland

establishment/monitoring period shall be determined by the Administrator or designee.

- (b) The permittee shall consider monitoring requirements fulfilled upon submittal of the final report and subsequent receipt of notice from the Administrator or designee. If the Administrator or designee fails to send notice to the permittee within 60 days after receipt of the final report, the monitoring requirement shall be considered fulfilled.
- (c) If at any time during the monitoring period, inspection or data indicate mitigation efforts are not succeeding, the Administrator or designee may require mid-course corrections which may include, but not limited to, re-vegetation, removal of invasive species, and/or controlled burns.
- (d) The permittee shall provide mechanisms to insure the long-term protection of the created, restored, or enhanced wetlands. This may be achieved through protection mechanism including vegetative management, deed restrictions, conservation easements, or deeding the created, restored, or enhance wetlands to an organization or public agency capable of protection and maintaining the wetland.
- (e) The Administrator or designee shall provide guidance to the applicant on the contents and timing of the Mitigation Plan and shall approve the plan prior to the Permit being issued.
- (f) If a permit is required by the U.S. Army Corps of Engineers, the permit application shall be provided to the City for concurrent review.

b. Application Requirements

The following items are required unless waived by the Administrator or designee:

- (1) Wetland Determination Report (approved by the US Army Corps of Engineers).

The applicant shall provide the following information to the Administrator or designee:

- (a) A map showing the exact location of wetlands within the development boundaries.
- (b) An aerial photograph delineating wetland, development, and watershed boundaries.
- (c) Army Corps of Engineers data sheets with representative color photographs shall be provided for



each wetland type along with a Jurisdictional Determination Report approved by the US Army Corps of Engineers.

- (d) A written description of the wetland(s) including a complete functional assessment.
- (e) A listing of all "Waters of the US" within or immediately adjacent to the development boundaries, including wetland type and size of each wetland.

(2) Wetland Use

The applicant will provide document regarding the following:

- (a) Determination if the project is water dependent and/or that no practicable alternatives to the impact exist.
- (b) Minimization of unavoidable impacts to the maximum extent possible.
- (c) Selection and justification of an appropriate mitigation option.
- (d) Appropriate use of wetlands for detention.

(3) Wetland Mitigation Plan

A mitigation plan shall include all the following information:

- (a) A description of the mitigation project, including best management practice proposed as fulfillment of the required replacement of lost wetland acreage and functions. The description shall include project location maps showing the geographic relationships between the proposed mitigation sites.
- (b) Plan view scaled drawing that include mitigation project locations, topography, cross-sections, stockpile areas, erosion and sediment control practice, equipment and supply storage areas.
- (c) A construction schedule that includes estimated starting and completion dates.
- (d) Hydrologic analysis that includes normal and 100-year surface elevation and estimated seasonal water surface elevations.
- (e) The scientific and common names of plant species used in the mitigation plan along with their planting location, spacing, propagule type, commercial source of planting stock, planting density, and planting method.

c. Monitoring Plan

- (1) In order to insure the establishment of the wetland mitigation site, the applicant shall provide the Administrator or designee with a monitoring plan that:
  - (a) Identifies the parties responsible for management; and
  - (b) States the management techniques, schedule, and funding mechanisms.
- (2) An annual monitoring report shall include the following:
  - (a) A description of how the mitigation project meets the mitigation standards.
  - (b) Description of activities and progress that has occurred in the previous year.
  - (c) Current photographs of the mitigation project.
  - (d) A description of any mid-course corrections taken or that need to be taken to implement the mitigation plan to meet the mitigation standards and updated schedule with explanation for changes for corrective actions.

d. Long-Term Maintenance

- (1) The applicant shall provide documentation to the Administrator or designee regarding who will be responsible for long-term maintenance and protection of the wetland(s). This documentation shall include:
  - (a) Contact information for parties responsible for maintenance.
  - (b) Types of preservation mechanisms used such as deed restrictions or conservation easements.
  - (c) Identification of funding mechanism for long-term maintenance.
- (2) Maintenance provisions of the Ordinance apply to restored, enhanced, or created wetlands.

4. Riparian Environment Provisions

a. Riparian environment serve the following functions:

- (1) Reduces flood flow rates, velocities, and volumes.
- (2) Prevents erosion and promotes bank stability of streams, lakes, ponds, or wetland shorelines.

- (3) Controls sediment from upland areas thus reducing the impact of urbanization on stream habitat and water quality by filtering and assimilating nutrients discharged from surrounding uplands.
  - (4) Insulates and moderates daily and seasonal stream temperature fluctuations by maintaining cooler in stream temperatures for areas with overhanging vegetation.
  - (5) Serves as important sites for de-nitrification, which reduces development of algal blooms and subsequent depressed levels of dissolved oxygen instream.
  - (6) Provides an effective mechanism for treatment of contaminated surface runoff.
  - (7) Provides habitat corridors for both aquatic and terrestrial fauna and flora.
  - (8) Provides recreational and aesthetics values for human use.
- b. Any applicant proposing development in a riparian environment shall identify the boundaries as the vegetative areas along waterways within the limits of the regulatory flood plain.
  - c. Tree-cutting and vegetation removal shall be minimized within riparian environments, and re-vegetation of disturbed areas shall take place as soon as possible. Avoidance and minimization is not necessary for removal of invasive or problematic species.
  - d. To the extent practicable, development in a riparian environment shall not, without mitigation:
    - (1) Adversely change the quantity, quality, or temporal and areal distribution of flows entering any adjacent wetlands or waters; nor
    - (2) Destroy or damage vegetation (unless part of a plan for removing non-native, invasive species) that overhangs, stabilizes, provides overland flow filtration, or shades stream channels, wetlands, or impoundments that normally contain water; nor
    - (3) Adversely affect any ground water infiltration functions.
  - e. The length of any mitigated channel shall be equal to or greater than the length of the disturbed channel.
  - f. Mitigation in riparian environments shall be in accordance with the procedures specified in Article IV Section C.3.b (3) of this Ordinance.
  - g. Mitigation measures in riparian environments shall include required provisions for long-term maintenance and funding as specified in Article IV Section C.3.d of this Ordinance.

5. Public Roadway Development Permit

a. Authority and Enforcement

- (1) The City shall be responsible for the review, enforcement, and issuance of all Public Road Development Permits.
- (2) The performance standards of this Ordinance shall apply to all public road developments. The release rate performance standard of Article IV, Section B.1.c. shall apply only to additional impervious surface areas or in the case of new road construction, the hydrologically disturbed areas. This release rate requirement shall be used unless watershed specific release rates have been adopted or it is determined by the Administrator or designee that other site conditions, including analysis of adequate downstream capacity, warrant further analysis and modification from this standard. Detention requirements shall be applied only to those projects described in Article IV, Section A.1.g.

b. Application Requirements

- (1) A copy of any applicable South Carolina DHEC (or other state) Permit application(s).
- (2) A copy of any applicable U.S. Army Corps of Engineers (or other federal) permit application(s).
- (3) A copy of the proposed Stormwater Management System, including the location and size of all existing and proposed drainage improvements including plan, section, and profile views of storm sewers, culverts, channels, and detention areas.
- (4) A copy of all calculations supporting the stormwater management system. Materials should be consistent with the submittal requirements of Article IV, Section B.2.b. (5) and the engineering requirements of Article IV, Section B.1.
- (5) A soil erosion and sediment control plan consistent with Article IV, Section B.1.i.
- (6) A Wetland Determination Report and Mitigation Plan consistent with Article IV, Section C.3, if applicable.

## **ARTICLE V: VARIANCES AND APPEALS**

### **A. Variances**

The Administrator or designee, upon application, after hearing, and subject to the process and standards that follow, may grant variances to the provisions of this Ordinance as will not cause detriment to the public good, safety, or welfare nor be contrary to the spirit, purpose, and intent of this Ordinance where, by reason of unique and exceptional physical circumstances or condition of a particular property, the literal enforcement of the provisions of this Ordinance would result in an unreasonable hardship.

1. For development requiring a Stormwater Permit from the City, the Administrator or designee shall administer the variance provisions.
2. A public notice will be issued inviting public comment on all proposed variances for major developments. The Planning Commission shall hold a public hearing and make a ruling recommendation to the City Council. The City shall publish a copy of the public notice 30 days before public hearing to allow for community comment.
3. Variances shall be granted only upon:
  - a. Showing of good and sufficient cause; and
  - b. A determination that the variance is the minimum necessary to afford relief, considering the flood hazard and water quality; and
  - c. A finding that failure to grant the variance would result in exceptional hardship to the applicant; and
  - d. A finding that the granting of a variance would not result in increased flood heights, additional threats to public safety, or any public expense, nor create nuisances, cause fraud, or victimization of the public, nor conflict with existing local laws or ordinances and that all buildings will be protected by methods that minimize flood damage during the base flood elevation; and
  - e. A finding that the development activity cannot be located outside the Regulatory Floodplain; and
  - f. A determination that the activity is not in a Regulatory Floodway. No variances shall be granted to any development located in a Regulatory Floodway. No variance shall be granted pertaining to Articles IV Section C.1.c; and
  - g. The applicant's circumstances are unique and do not represent a general problem; and
  - h. The granting of the variance will not alter the essential character of the area involved including existing stream uses.
4. Upon consideration of the Planning Commission's recommendation, factors noted above, and the intent of the Ordinance, the Administrator or designee

may attach such conditions to the granting of a variance deemed necessary to further the purposes and objectives herein.

5. Variances requested in connection with restoration of a historic site or building listed on the National Register of Historical Places or documented as worthy of preservation by the South Carolina Historic Preservation Agency may be granted using criteria more permissive than the requirements contained in this Article.
6. The Administrator or designee shall notify an applicant in writing that a variance from the requirements of Article IV, Section C.1. that would lessen the degree of protection to a building will result in increased premium rates for flood insurance up to amounts as high as \$25 for \$100 of insurance coverage, increase the risks to life and property, and require that the applicant will acknowledge in a signed exception to title the assumption of the risks and liability and will pay upon approval of the variance a recording fee above and beyond the usual permit review fee.
7. In a Regulatory Floodplain without a Regulatory Floodway where the tributary drainage area is 640 acres or more, a variance may not be granted that will result in a loss of the Regulatory Floodplain storage of greater than 10% of the existing Regulatory Floodplain storage on the site.
8. Variances requested in connection with the redevelopment of previously developed sites, that will further the public policy goals of downtown redevelopment and neighborhood revitalization, may be granted a variance provided the variance would not result in an increase in the pre-redevelopment runoff rate or volume and there will exist adequate downstream stormwater capacity. No variance shall be granted pertaining to Article IV, Section C.1.c.
9. Due to the unique nature of public road developments occurring in a narrow R.O.W. instead of an expansive tract of land, variances requested in connection with public road developments that will further the public policy of minimizing the condemnation of private or public property may be granted using criteria more permissive than the requirements of Article V, Section A.2 to the minimum extent necessary to achieve the minimal amount of condemnation. No variances shall be granted pertaining to Articles IV, Section C.1.c.
10. Written findings shall be made public for all variances and shall be on file with the City of Greenville.

**B. Appeals**

1. Any permit applicant aggrieved by the denial or conditions of a Stormwater Permit, Earth Change Approval, Conditional Approval, or Variance by the Administrator may appeal it to the City Council by written notice filed with the Administrator within 30 days of the disputed act or actions.

## **ARTICLE VI: INSPECTIONS AND ACCESS**

Representatives of the City and of any federal and state unit of government are authorized to enter upon any land or water to inspect development activity and to verify the existing conditions of a development site that is currently under permit review.

### **A. Inspection**

The Administrator or designee may inspect site development at any stage in the construction process. For major developments, the Administrator or designee shall conduct site inspections, at a minimum, at the end of the construction stages 1. and 7. listed below. Construction plans approved by the Administrator or designee shall be maintained at the site at all times during progress of the work.

The Designated Erosion Control Inspector shall conduct inspections and document as described below, at a minimum, at the intervals in 1. and 6. listed below, for those developments that require a Designated Erosion Control Inspector.

1. Upon completion of installation of sediment and runoff control measures (including perimeter controls and diversions), prior to proceeding with any other earth disturbance or grading,
2. After stripping and clearing,
3. After rough grading,
4. After final grading,
5. After seeding and landscaping deadlines,
6. Every seven (7) calendar days or after every fourteen (14) days and within 24 hours on any storm event with greater than 0.5-inches of rainfall,
7. After final stabilization and landscaping, prior to removal of sediment controls.

If a wetland mitigation area is constructed as part of the Stormwater Permit, it is recommended that a Wetland Scientist at a minimum perform the following inspections:

8. After final grading and before seeding or plant installation.
9. After seeding and plant installation.
10. Annual inspections during the monitoring and maintenance period.

If stripping, clearing, grading and/or landscaping are to be done in phases or areas, the permittee shall plan for appropriate erosion control measures to be in place after each stage listed above and for each phase of construction.

### **B. Special Precautions**

1. If at any stage of the grading of any development site the Administrator or designee determines that the nature of the site is such that further work authorized by an existing permit is likely to imperil any property, public way, stream, lake, wetland, or drainage structure, the Administrator or designee may require, as a condition of allowing the work to be done, that such reasonable special precautions be taken as is considered advisable to avoid the likelihood

of such peril. Special Precautions may include, but shall not be limited to, a more level exposed slope, construction of additional drainage facilities, berms, terracing, compaction, or cribbing, installation of plant materials for erosion control, and recommendations of a licensed soils engineer and/or engineering geologist which may be made requirements for further work.

2. Where the Administrator or designee determines that storm damage may result or has resulted because the grading on any development site is not complete, work may be stopped and the permittee required to install temporary structures or take such other measures as may be required to protect adjoining property or the public safety. On large developments or where unusual site conditions prevail, the Administrator or designee may require that the operations be conducted in specific stages so as to insure completion of protective measures or devices prior to the advent of seasonal rains.
3. Stormwater Quality Runoff Standards: The Administrator or designee may set turbidity or total suspended solids limits for development sites that discharge to Waters of the United States or Waters of the State or their buffers or that are in close proximity to the above, as determined by the Administrator or designee. These standards shall apply to development site construction up to the point of permanent site stabilization as determined by the Administrator or designee.
  - a. Turbidity or total suspended solids limits shall apply only to development requiring both a Stormwater Pollution Prevention Plan as part of their General NPDES Permit No. SCR030000 and a detention pond or similar stormwater storage system in order to use that stormwater management system for additional treatment measures needed to meet the standards in this section.
  - b. If a singular storm event exceeds the 100-year design-storm storage volume of the development site stormwater management system, water quality readings taken during that event will not be considered a violation of this Ordinance, unless caused by gross negligence on the site.
  - c. The developer should conduct site runoff sampling during storm events exceeding ½ inch of rainfall and include the results in the weekly inspection reports required by the Stormwater Pollution Prevention Plan described in a. above.
  - d. In the case of dredging or development activities within a Waters of the United States or Waters of the State, specific permit conditions may be set with regard to time allowed for the activity to be completed and additional erosion control measures to be implemented.

C. Designated Erosion Control Inspector

The Designated Erosion Control Inspector shall inspect the development site as specified above and, at a minimum, perform the following:

1. Keep a copy of the Administrator or designee-approved soil erosion and sediment control plans at the development site at all times.
2. Keep a written log of all inspections that shall contain, at a minimum, conditions of the soil erosion and sediment control measures and any corrective actions that need to be taken. The Designated Erosion Control Inspector log shall be



kept at the development site at all times and shall be made available for inspection upon request of the Administrator or designee.

3. Notify the Administrator or designee within 24-hours when the development site is determined to be not in compliance with this Ordinance or the approved soil erosion and sediment control plans and the proposed corrective measures to be taken.
4. Recommend to the applicant additional soil erosion and sediment control prevention measures, if necessary, to reduce sediment leaving a development.
5. For development requiring conformance with Article VI Section B.3 above, the Designated Erosion Control Inspector is responsible for site runoff sampling and reporting requirements.

## **ARTICLE VII: ILLICIT DISCHARGES**

### **A. Purpose and Intent**

The purpose and intent of the section is to provide for the health, safety and general welfare of the citizens of Greenville through the regulation of non-stormwater dischargers in the storm drainage system to the maximum extent practicable as required by federal and state law. This section establishes methods for controlling the introduction of pollutants into the municipal separate storm sewer system in order to comply with requirements of the National Pollutant Discharge Elimination System (NPDES) permit process. The objectives of this ordinance are:

1. To regulate the contribution of pollutants to the municipal separate storm sewer system by stormwater discharges by any user
2. To prohibit Illicit Connections and Discharges to the municipal separate storm sewer system
3. To establish legal authority to carry out all inspection, surveillance and monitoring procedures necessary to ensure compliance with this ordinance.

### **B. Illicit Discharges**

No person shall discharge or cause to be discharged into the municipal storm drain system or watercourses any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than storm water. Prohibited substances include but are not limited to: oil, anti-freeze, chemicals, animal waste, paints, garbage, and litter.

The commencement, conduct or continuance of any illegal discharge to the storm drain system is prohibited except as described as follows:

1. The following discharges are exempt from discharge prohibitions established by this ordinance: water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, non-commercial washing of vehicles, natural riparian habitat or wet-land flows,

swimming pools (dechlorinated - less than one PPM chlorine), fire fighting activities, street wash water, and any other water source not containing Pollutants.

2. Discharges specified in writing by the authorized enforcement agency as being necessary to protect public health and safety.
3. Dye testing is an allowable discharge, but requires a written notification to the authorized enforcement agency prior to the time of the test.
4. The prohibition shall not apply to any non-storm water discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the Federal Environmental Protection Agency or South Carolina DHEC, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

C. Illicit Connections

1. Connections to a stormwater conveyance or stormwater conveyance system that allow the discharge of non-stormwater, other than the exclusions described in section (A) above, are unlawful. Prohibited connections include, but are not limited to: floor drains, wastewater from washing machines or sanitary sewers, wash water from commercial vehicle washing or steam cleaning, and wastewater from septic systems.
2. Where such connections exist in violation of this section and said connections were made prior to the adoption of this provision or any other ordinance prohibiting such connections, the property *owner* or the person using said connection shall remove the connection within six months following the effective date of this ordinance. However, the six-month grace period shall not apply to connections which may result in the discharge of hazardous materials or other discharges which pose an immediate threat to health and safety, or are likely to result in immediate injury and harm to real or personal property, natural resources, wildlife, or habitat.
3. Where it is determined that said connection:
  - (a) May result in the discharge of hazardous materials or may pose an immediate threat to health and safety, or is likely to result in immediate injury and harm to real or personal property, natural resources, wildlife, or habitat, or
  - (b) Was made in violation of any applicable regulation or ordinance, other than this section; the Administrator or designee shall designate the time within which the connection shall be removed. In setting the time limit for compliance, the Administrator or designee shall take into consideration:
    - i. The quantity and complexity of the work,
    - ii. The consequences of delay,
    - iii. The potential harm to the environment, to the public health, and to

- iv. The cost of remedying the damage.

D. Spills

Spills or leaks of polluting substances released, discharged to, or having the potential to released or discharged to the stormwater conveyance system, shall be contained, controlled, collected, and properly disposed. All affected areas shall be restored to their pre-existing condition.

Persons in control of the polluting substances immediately prior to their release or discharge, and persons owning the property on which the substances were released or discharged, shall immediately notify the City of Greenville Emergency Management Coordinator and the Public Works Department of the release or discharge, as well as making any required notifications under state and federal law. Notification shall not relieve any person of any expenses related to the restoration, loss, damage, or any other liability which may be incurred as a result of said spill or leak, nor shall such notification relieve any person from other liability which may be imposed by State or other law.

E. Nuisances

Any condition caused or permitted to exist in violation of any of the provisions of this section is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored at the violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be taken.

#### **ARTICLE VIII: PENALTIES AND LEGAL ACTIONS**

- A. Whenever the Administrator or designee finds a violation of this Ordinance, or of any permit or order issued pursuant thereto, within their respective jurisdiction, the Administrator or designee may issue a stop work order on all development activity on the subject property or on the portion of the activity in direct violation of the Ordinance. In every case, the Administrator or designee shall issue an order that (1) describes the violation (2) specifies the time period for remediation and (3) requires compliance with this Ordinance prior to the completion of the activity in violation.
- B. Failure to comply with any of the requirements of this Ordinance shall constitute a violation. Any violation thereof shall be subject to a fine of not more than one thousand (\$1000.00) dollars for each violation. Each day the violation continues shall be considered a separate offense.
- C. The City may also take any other legal action necessary to prevent or remedy any violation including appropriate equitable or injunctive relief and, if applicable, an assessment to the violator for the removal, correction, or termination of any adverse effects upon any property resulting from any unauthorized activity for which legal action under this section may have been brought.
- D. The City may record a notice of violation on the title to the property at the Greenville County Recorder of Deeds Office.
- E. The Administrator or designee shall inform the owner that any such violation is considered a willful act to increase flood damages and, therefore, may cause FEMA to initiate a Section 1316 of the National Flood Insurance Act of 1968 action.
- F. The remedies list in this Ordinance are not exclusive of any other remedies available under any applicable federal, state, or local law and is within the discretion of the authorized enforcement agency to seek cumulative remedies.

#### **ARTICLE IX: DISCLAIMER OF LIABILITY**

It is recognized that although the degree of flood protection required by this Ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations, on occasions greater floods can and will occur, and flood heights may be increased by man-made or natural causes. These provisions do not imply that land outside the flood-plain areas or that uses permitted within such areas will be free from flooding or flood damages. These provisions shall not create liability on the part of the City of Greenville nor any officer or employee thereof for any claims, damages or liabilities that result from reliance on this Ordinance or any administrative decision lawfully made hereunder.

#### **ARTICLE X: SEPARABILITY**

The provisions of this Ordinance shall be deemed separable and the invalidity of any portion of this Ordinance shall not affect the validity of the remainder.

#### **ARTICLE XI: ABROGATION AND GREATER RESTRICTIONS**

This Ordinance is not intended to repeal, abrogate or impair any existing deed or plat restrictions. Where this Ordinance and other ordinance deed or plat restrictions conflict or overlap, whichever imposes the more stringent restrictions shall prevail. This Ordinance is intended to repeal the original Ordinance or resolution which was adopted to meet the National Flood Insurance Program regulations, but is not intended to repeal the resolution which the City of Greenville passed in order to establish initial eligibility for the program.

#### **ARTICLE XII: EFFECTIVE DATE**

The effective date of this Ordinance shall be February 1, 2008.

## **APPENDIX A – DEFINITIONS**

adequate downstream stormwater capacity: A stormwater management system shall be considered to have adequate downstream stormwater capacity if the system can be shown to store or convey up to and including the 100-year stormwater runoff without increasing damage to adjoining properties or to a point downstream known to the Administrator or designee to be a restriction causing significant backwater.

agricultural practices: These practices include: normal farming, silviculture and ranching activities such as gardening, plowing, seeding, cultivating, harvesting for the production of food, fiber, forest products, nursery stock and livestock; maintenance of agricultural drain tiles, irrigation and drainage ditches; maintenance of farm roads and other access areas for farm vehicles and equipment use.

applicant: Any person, firm or governmental agency who owns property or the duly appointed representative that wishes to develop that property and one who executes the necessary forms to procure a permit to carry out such development from the City.

Appropriate Use: Only uses of the Regulatory Floodway that are permissible and will be considered for permit issuance. The only uses that will be allowed are as specified in Article IV, Section C.3.

as-built drawings: See record drawings.

base flood: The flood having a one percent probability of being equaled or exceeded in any given year. The base flood is also known as the 100-year frequency flood event. Application of the base flood elevation at any location is as defined in Article IV, Section C.1 of this Ordinance.

base flood elevation (BFE): The elevation delineating the level of flooding resulting from the one percent chance (100-year flood) frequency storm event.

basement: Any area of a building having its floor subgrade (below grade level) on all sides.

basin: Sub-watershed areas the City of Greenville.

basin plan: A study and evaluation of an individual drainage basin's stormwater management, flood control, and restoration / mitigation needs.

Best Management Practice (BMPs): Design, construction, and maintenance practices and criteria for stormwater facilities that minimize the impact of stormwater runoff rates and volumes, prevent erosion, and capture pollutants.

building: A structure that is principally above ground and is enclosed by walls and a roof. The term includes a gas or liquid storage tank, a manufactured home, mobile home or a prefabricated building. This term also includes recreational vehicles and travel trailers to be installed on a site for more than 180 days.

buffer: An area of predominantly vegetated land to be left open, adjacent to drainageways, wetlands, lakes, ponds or other surface waters for the purpose of eliminating or minimizing adverse impacts to such areas.

by-pass: To route tributary drainage area runoff around and not through a stormwater control structure.

channel: Any river, stream, creek, brook, branch, natural or artificial depression, ponded area, lake, flowage, slough, ditch, conduit, culvert, gully, ravine, swale, wash, or natural or man-made drainageway, in or into which surface or groundwater flows, either perennially or intermittently.

channel modification: Alteration of a channel by changing the physical dimensions or materials of its bed or banks. Channel modification includes damming, rip-rapping or other armoring, widening,

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## APPENDIX A: DEFINITIONS

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deepening, straightening, relocating and lining and significant removal of bottom or woody vegetation of the channel. Channel modification does not include the clearing of dead or dying vegetation, debris, or trash from the channel.

City-approved wetland bank: A wetland bank approved by the City.

City Manager or designee: The Administrator and the designee shall be a person designated by the City Manager for the purpose of permitting development and administering and enforcing all of the provisions of this Ordinance.

City Wetland Restoration Fund: A fund that is administered and implemented for wetland impact mitigation that is approved and adopted by the City.

compensatory storage: An excavated, hydraulically equivalent volume of storage used to offset the loss of natural flood storage capacity when artificial fill or structures are placed within a Regulatory Floodplain.

conditional approval Regulatory Floodway map change: Pre-construction approval by the Federal Emergency Management Agency of a proposed change to the Regulatory Floodway map and/or BFE. This pre-construction approval, pursuant to this Part, gives assurance to the property owner that once an Appropriate Use is constructed according to permitted plans, the Regulatory Floodway map and/or BFE can be changed, as previously agreed, upon review and acceptance of as-built plans.

Conditional Letter of Map Revision (CLOMR): A letter which indicated that the Federal Emergency Management Agency will revise base flood elevations, flood insurance rate zones, flood boundaries or Regulatory Floodway and/or BFE as shown on an effective Flood Hazard Boundary Map or Flood Insurance Rate Map, once the as-built plans are submitted and approved.

control structure: A structure designed to control the rate of flow that passes through the structure, given a specific upstream and downstream water surface elevation.

critical facility: A facility that is critical to the community's public health and safety, is essential to the orderly functioning of a community, store or produce highly volatile, toxic or water-reactive materials, or house occupants that may be insufficiently mobile to avoid loss of life or injury. Examples of critical facilities include jails, hospitals, schools, fire stations, nursing homes, wastewater treatment facilities, water plants, and gas/oil/propane storage facilities.

dam: All obstructions, wall embankments or barriers, together with their abutments and appurtenant works, if any, constructed for the purpose of storing or diverting water or creating a pool. Underground water storage tanks are not included.

damage: A measurable rise in flood heights on property currently subject to flooding, flooding of property currently not subject to flooding unless it is contained within the streambanks or a deed or plat restricted area or increases in velocity to the point where the rate of land lost to erosion and scour is significantly increased.

deed or plat restriction: Permanent easements, covenants, deed restricted open spaces, outlots, reserved plat areas, and conservation easements dedicated to meet the requirements of this Ordinance, or public road rights of way that contain any part of the stormwater management system of a development.

depressional storage areas: Non-riverine depressions where stormwater collects.

design storm: A selected storm event, described in terms of the probability of occurring once within a given number of years, for which stormwater or flood control improvements are designed and built.

Designated Erosion Control Inspector: A person responsible for, at a minimum, verifying compliance and on-going maintenance of the approved soil erosion and sediment control plan measures of a development and who is recommended to meet the minimum qualification requirements of a, b, c, and d, as follows:

- a. Provide a one-page statement of qualifications in the areas noted below and a request to be included on the Designated Erosion Control Inspector qualified listing. The signed statement will be considered as evidence of qualifications.
- b. Pass the *Certified Erosion Prevention & Sediment Control Inspector Program* administered by Clemson University.
- c. Two years cumulative experience on soil erosion and sediment control inspections.
- d. The listing of Designated Erosion Control Inspectors shall be officially updated every three years by the City. A minimum of 24 work-related professional development hours shall be obtained within the three-year period in order to qualify for re-listing. Documentation shall be self-monitoring and shall be provided to the City upon application for listing.

detention facility: A man made structure for the temporary storage of stormwater runoff with controlled release during or immediately following a storm.

Detention Volume Safety Factor: A multiplication factor applied to a development's detention volume when the detention facility is constructed on-stream.

Developed multi-residential and nonresidential property: Developed property which does not serve the primary purpose of providing permanent dwelling units for single-family detached units and duplexes, regardless of the zoning district in which such property is located. Such property shall include but not be limited to triplexes, apartment buildings and complexes, condominiums, boardinghouses, commercial properties, industrial properties, parking lots, recreational, institutional and governmental facilities, hotels, offices, schools and other educational facilities, theaters and other facilities for performances, and churches and other religious institutions.

Developed property: Real property which has been altered from its natural state by the addition and attachment of any improvements such as buildings, structures or other impervious area. For new construction, property shall be considered developed property upon final approval of site improvements by the city.

Developed residential property: Developed property which serves the primary purpose of providing a permanent dwelling unit or units, regardless of the zoning district in which such property is located, for single-family detached units and duplexes, and which may or may not have accessory uses related to the purpose of providing permanent dwelling facilities.

development: Completion of a final plat, replat, or man-made change to real estate by private or public agencies including:

- a. Construction, reconstruction, repair, or placement of a building or any addition to a building;
- b. Installation of a manufactured home on a site, preparation of a site for a manufactured home, or the placement of a recreational vehicle on a site for more than 180 days;



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## APPENDIX A: DEFINITIONS

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- c. Drilling, mining, installation of utilities, construction of roads, bridges, or similar projects;
- d. Clearing of land as an adjunct of construction;
- e. Construction or erection of levees, walls, fences, dams, or culverts; channel modification; filling, dredging, grading, excavating, paving, or other alterations of the ground surface; storage of materials; deposit of solid or liquid waste;
- f. Any other activity that might change the direction, height, volume or velocity of flood or surface water, including the drainage of wetlands and removal of vegetation to the extent such that the wetland would no longer meet the criteria of supporting hydrophytic vegetation as defined in this Ordinance except that which would be considered appropriate for management purposes.

Development does not include maintenance of existing buildings and facilities such as resurfacing of roadways when the road elevation is not increased, or gardening, plowing, and similar agriculture practices that do not involve filling, grading, or construction of levees. Nor does development include agriculture practices outside of the Regulatory Floodplain involving filling or grading as part of a Natural Resources Conservation Service designed and approved conservation project (i.e., terraces, grass waterways). Additionally, development does not include fence installation, pole placement, drilling or other minor auxiliary construction activity which does not affect stormwater runoff rates or volumes as long as the development activity is not located in a Regulatory Floodplain, wetland, or channel.

dominant: The '50/20 Rule' will be adopted for the purposes of this Ordinance. Dominant plant species are the most abundant species that comprise greater than or equal to 50% of the vegetative layer or any one species that comprises 20% or more of the vegetative specimens. The vegetative layer is defined as a subunit of a plant community in which all component species exhibit the same growth form (e.g., trees, saplings, shrubs, herbs).

drainage area: The land area above a given point that contributes stormwater to that point.

dry detention facility: A dry detention facility is a detention facility designed to drain completely after temporary storage of stormwater flows and to normally be dry over the majority of its bottom area.

elevation certificate: A form published by the Federal Emergency Management Agency that is used to certify the elevation to which a building has been constructed.

emergency overflow: The structure in a stormwater management system designed to protect the system in the event of a malfunction of the primary flow structure or a storm event greater than the system design. The emergency overflow capacity initiates at the facility design high water level or base flood elevation.

erosion: The process whereby soil is removed by flowing water or wave action.

Equivalent residential unit (ERU): The total impervious area of a typical single-family residential property, and is defined as the median impervious area of a representative sample of all developed residential properties in the single-family residential category. The equivalent residential unit is 2,389 square feet.

Existing Manufactured Home Park: A manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the flood plain management regulations adopted by a community.

Expansion to an Existing Manufactured Home Park: The preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

extreme flood protection: Measures taken to prevent adverse impacts for large low-frequency storm events with a return frequency of 100-years or more.

Fee: The annual monetary amount charged to a property owner of record of real property for the services provided by the stormwater utility system and program.

FEMA: Federal Emergency Management Agency and its regulations codified as 44 CFR 59-79 effective as of October 1, 1986.

flood: A general and temporary condition of partial or complete inundation of normally dry land areas from overflow of inland or tidal waves, or the unusual and rapid accumulation of runoff of surface waters from any source.

flood frequency: A period of years, based on a statistical analysis, during which a flood of a stated magnitude may be expected to be equaled or exceeded.

Flood-resistant material: Any building material capable of withstanding direct and prolonged contact (minimum 72 hours) with floodwaters without sustaining damage that requires more than low-cost cosmetic repair. Any material that is water-soluble or is not resistant to alkali or acid in water, including normal adhesives for above-grade use, is not flood-resistant. Pressure-treated lumber or naturally decay-resistant lumbars are acceptable flooring materials. Sheet-type flooring coverings that restrict evaporation from below and materials that are impervious, but dimensionally unstable are not acceptable. Materials that absorb or retain water excessively after submergence are not flood-resistant. Please refer to Technical Bulletin 2-93, *Flood-Resistant Materials for Buildings Located in Special Flood Hazard Areas in Accordance with the National Flood Insurance Program*, document number FIA-TB-2, dated 4/93, and available from the Federal Emergency Management Agency. Class 4 and 5 materials, referenced therein, are acceptable flood-resistant materials

Flood Insurance Rate Maps (FIRM): A map prepared by the Federal Emergency Management Agency or HUD that depicts the Special Flood Hazard Area (SFHA) within a community. This map includes insurance rate zones and Regulatory Floodplains and may or may not depict Regulatory Floodways.

Flood Insurance Study: An examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudslide (i.e., mudflow) and/or flood-related erosion hazards.

floodplain (regulatory): See Regulatory Floodplain.

floodplain management: An overall program of corrective and preventive measures for avoiding or reducing future flood damage.

floodplain study: A study, formally adopted by the City, excluding base flood determinations performed for a specific development site, that examines, analyzes, evaluates or determines the hydraulic and hydrologic characteristics of flood hazards for a basin or partial basin area. To be used as a regulatory instrument the study shall, at a minimum, meet the FEMA criteria specified in Guidelines and Specifications for Flood Hazard Mapping Partners, most current version.

flood-prone area: Any area inundated by the base flood.

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Flood Protection Elevation (FPE): The elevation of the base flood elevation plus two feet of freeboard required and four feet of freeboard recommended at the discretion of the Administrator or designee.

flood-proofing: Any combination of structural and non-structural additions, changes, or adjustments to structures or property which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

flood-proofing certificate: A form published by the Federal Emergency Management Agency that is used to certify that a building has been designed and constructed to be structurally dry flood-proofed to the Flood Protection Elevation.

floodway (regulatory): See Regulatory Floodway.

freeboard: An increment of height added to the base flood elevation to provide a factor of safety for uncertainties in calculations, unknown local conditions, wave actions and unpredictable effects such as those caused by ice or debris jams.

High quality aquatic resources (HQAR): Waters of the United States or Waters of the State that are determined to be critical due to their uniqueness, scarcity, function, and/or value.

historic structure: A "Historic Structure" is any structure that is:

- a. Listed individually in the National Register of Historic Places or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- b. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;
- c. Individually listed on the State inventory of historic places; or
- d. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified:
  - (1) by an approved State program as determined by the Secretary of Interior; or
  - (2) directly by the Secretary of Interior in states without approved programs.

Some structures or districts listed on the State or local inventories **MAY NOT** be "Historic" as cited above, but have been included on the inventories because it was believed that the structures or districts have the **potential** for meeting the "Historic" structure criteria of the Department of Interior. In order for these structures to meet NFIP historic structure criteria, it must be demonstrated and evidenced that the South Carolina Department of Archives and History has **individually determined** that the structure or district meets Department of Interior historic structure criteria.

hydraulically equivalent compensatory storage: Compensatory Storage placed between the proposed normal water elevation and the proposed 100-year flood elevation. All storage lost or displaced below the existing 10-year flood elevation is replaced below the proposed 10-year flood elevation. All storage lost or displaced above the existing 10-year flood elevation is replaced above the proposed 10-year flood elevation.

hydrologic and hydraulic calculations: Engineering analysis which determines expected flood flows and flood elevations based on land characteristics and rainfall events.

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hydric soil: A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part.

hydrologically disturbed: An area where the land surface has been cleared, grubbed, compacted, or otherwise modified to alter stormwater runoff, volumes, rates, flow direction, or inundation duration.

hydrophytic vegetation: Plant life typically adapted for life in saturated soil conditions or water.

illicit discharge: Any discharge or dumping of material into the stormwater management system, a flood-prone area, or a waters of the US/State that is not composed entirely of stormwater.

impervious surface: Any hard-surfaced, man-made area that does not readily absorb or retain water including, but not limited to, building roofs, parking and driveway areas, graveled areas, sidewalks, and paved recreation areas.

in-kind replacement (culvert): An in-kind culvert replacement has an equivalent cross-sectional area, shape, roughness coefficient, and inlet and outlet elevations; or the replacement may be shown to have an equivalent hydraulic capacity using appropriate engineering calculations.

inspect: To visit, to review plans, or to oversee a site visit or plan review per generally accepted engineering practices.

lake: A natural or artificial body of water encompassing an area of two (2) or more acres which retains water throughout the year.

Letter of Map Amendment (LOMA): Official determination by FEMA that a specific structure is not in a Special Flood Hazard Area; amends the effective Flood Hazard Boundary Map (FHBM) or Flood Insurance Rate Map (FIRM).

Letter of Map Revision (LOMR): Letter issued by FEMA that revises base flood elevation, flood insurance rate zones, flood boundaries or Regulatory Floodways as shown on an effective FHBM or FIRM.

low opening elevation: The elevation at which water could enter a structure through any non-watertight opening such as a doorway threshold, a window sill, or a basement window well.

lowest adjacent grade: The lowest finished grade adjacent to a structure, not including the bottom of window wells.

lowest floor: The lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; *Provided*, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirement of the *Code of Federal Regulations 44, Part 60.3*.

manufactured home: A structure, transportable in one or more sections, which is built on a permanent chassis and is designated for use with or without a permanent foundation when connected to the required utilities. The term manufactured homes also include park trailers, recreational vehicles, and other similar vehicles installed on-site for more than 180 consecutive days.

manufactured home park or subdivision: A parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

mitigation: Measures taken to eliminate or minimize damage from development activities, such as construction in wetlands or Regulatory Floodplain filling, by replacement of the resource.

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natural: When used in reference to streams and channels means those streams and channels formed by the existing surface topography of the earth prior to changes made by man. A modified stream and channel which has regained natural characteristics over time as it meanders and reestablishes vegetation may be considered natural.

NAVD: North American Vertical Datum of 1988. The datum listed as the reference datum on Flood Insurance Rate Maps should be used for Elevation Certificate and Floodproofing certificate completion.

New Construction: For the purposes of determining insurance rates, structures for which the “start of construction” commenced on or after the effective date of an initial FIRM or after December 31, 1974, whichever is later, and included any subsequent improvements to such structures. For flood plain management purposes, new construction means structures for which the start of construction commenced on or after the effective date of the flood plain management regulation adopted by a community and included any subsequent improvements to such structures.

New Manufactured Home Park: A manufactured home park for which the construction of facilities for servicing homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of flood plain management regulation adopted by a community.

non-riverine Regulatory Floodplain: Regulatory Floodplains not associated with streams, creeks, or rivers, such as isolated Depressional storage area or lakes.

on-stream detention: Any detention facility that has off-site tributary drainage area.

open waters: Permanently inundated Waters of the State that are greater than 3.0 feet in depth below the normal water level or normal pool elevation.

ordinary high water mark: The point on the bank or shore established by the fluctuations of water and are indicated by physical characteristics. Distinctive marks may be present, such as by erosion, destruction, or prevention of terrestrial vegetation, predominance of aquatic vegetation, or other such recognized characteristics.

overland flow path: An area of land which conveys stormwater for all events up to and including the base flood event. The overland flow path can be estimated using readily available topographic information and shall take into account all on-site and off-site tributary areas in accordance with Article IV, Section B.1.f (3).

ownership parcel: Any legally described parcel of land. This includes contiguous lots or parcels of land, owned in whole, or in part, by the same property owner.

Parcel Identification Number (PIN): Permanent index number used to identify properties for tax assessment.

Pollutant: Any substance harmful to the environment that is not authorized for discharge from a storm sewer by a South Carolina DHEC MS4 or NPDES Permit.

pond: A natural or artificial body of water of less than two acres which retains water year round.

pre-development: Pre-development conditions for the purpose of this Ordinance assume land use conditions prior to the proposed development or re-development. In such cases where development is initiated prior to receiving appropriate local, state, and federal permits, the land use condition will be assumed to be the condition prior to European Settlement. In this situation, the vegetative cover is assumed to be native forest.

Property owner of record: The person identified as owner by county tax records.

public flood control project: A flood control project within a deed or plat restricted area, which will be operated and maintained by a public agency to reduce flood damages to existing buildings or structures. A land stewardship not-for-profit corporation, or similar entity, may also own, operate, or maintain a public flood control project. In this circumstance, there shall also be an executed agreement with a public agency to take over ownership, operation, or maintenance if the corporation dissolves or fails to meet the operation and maintenance requirements for the project area. The project shall include a hydrologic and hydraulic study of the existing and proposed conditions of the watershed area affected by the project. Nothing in this definition shall preclude the design, engineering, construction, or financing, in whole or in part, of a flood control project by persons or parties who are not public agencies.

public road development: Any development activities which take place in a public right-of-way or part thereof that is administered and funded, in whole or in part, by a public agency under its respective roadway jurisdiction. Rehabilitative maintenance and in-kind replacement are considered to be a public road development if located in a Regulatory Floodplain. A public road development located within a Regulatory Floodway and which has been approved by the South Carolina Department of Transportation is exempt from the hydraulic analysis requirements of this Ordinance. Individual recreation trail systems being constructed that are not part of another development project and linear railroad development projects shall be considered public road developments with respect to the requirements of this Ordinance.

reconstruction: The act of rebuilding a structure.

record drawings: Upon completion of the development a registered professional engineer or land surveyor, in accordance with SC law, shall certify Construction drawings of what was built and that the development is built in accordance with the submitted plans and previous pre-development certifications.

Recreational vehicle: A vehicle which is:

- a. Built on a single chassis;
- b. 400 square feet or less when measured at the largest horizontal projection;
- c. Designed to be self-propelled or permanently towable by a light duty truck; and,
- d. Designed primarily not for use as a permanent dwelling, but as temporary living quarters for recreational, camping, travel, or seasonal use.

Registered Professional Engineer: An engineer licensed in the State of South Carolina, under the South Carolina Code of Regulations Chapter 49.

Regulatory Floodplain: Regulatory Floodplains may be either riverine or non-riverine depressional areas. Floodplain boundaries shall be delineated by projecting the base flood elevation onto the best available topography. A flood-prone area is a Regulatory Floodplain if it meets any of the following descriptions:

- a. Any riverine area inundated by the base flood where there is at least 640 acres of tributary drainage area.
- b. Any non-riverine area with a storage volume of 0.75 acre-foot or more when inundated by the base flood.

- c. Any area indicated as a Special Flood Hazard Area on the FEMA Flood Insurance Rate Map and located with the best available topography to be inundated by the base flood.

Regulatory Floodway: The channel, including on-stream lakes, and that portion of the Regulatory Floodplain adjacent to a stream or channel which is needed to store and convey the existing and anticipated future 100-year frequency flood discharge with no more than a 0.5 foot increase in stage due to the loss of flood conveyance or storage, and no more than a 10% increase in velocities. Where interpretation is needed to determine the exact location of the Regulatory Floodway boundary, the City should be contacted for the interpretation.

Rehabilitative maintenance (roadway): Rehabilitative maintenance is repair or maintenance that does not increase the traffic lanes and does not involve changes to the roadway elevation.

Repair, remodeling or maintenance: Activities which do not result in any increases in the outside dimensions of a building or any changes to the dimensions of a structure.

repetitive loss: Flood-related damages sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each such flood event on the average, equals or exceeds 25 percent of the market value of the structure before the damage occurred.

retention facilities: A facility designed to completely retain a specified amount of stormwater runoff without release except by means of evaporation, infiltration, or pumping.

Revenues: All fees, assessments or other income received by the stormwater utility, including but not limited to amounts received from the investment or deposit of monies in any fund or account, and all amounts received as gifts or donations, and the proceeds from the sale of bonds to finance the stormwater management program, or any other type of funds derived from grants, charges or loans which by purpose or effect relate to stormwater management activities.

Riparian: Vegetated areas within the limits of the regulatory floodplain or flood prone area conveyance path, bordering a waterway that provides habitat or amenities dependent on the proximity to water.

riverine: Relating to, formed by, or resembling a stream (including creeks and rivers).

roadside ditches: Drainage ditches within 25 feet from the edge of the outside travel lane.

Section 1316 of the National Flood insurance Act of 1968: The act provides that no new flood insurance shall be provided for any property found by the Federal Emergency Management Agency to have been declared by a state or local authority to be in violation of state or local ordinances.

sedimentation: The process that deposits soils, debris, and other materials either on other ground surfaces or in bodies of water or watercourses.

Special Flood Hazard Area (SFHA): Any area subject to inundation by the base flood from a river, creek, stream, or any other identified channel or ponding and shown on the Regulatory Floodplain map as listed in Appendices B and C.

Start of Construction: The date the permit was issued provided the actual start of construction, repair, reconstruction, rehabilitation, addition placement or other improvement was within 180 days of the permit date. The actual start date includes the first day of any land preparation, including clearing, grading, filling, or excavation. For substantial improvements, the actual start of construction means the

first alteration of any wall, ceiling, floor, or other structural part of a building whether or not that alteration affects the external dimensions of the building.

Stormwater Facility: See stormwater management system.

stormwater management: A set of actions taken to control stormwater runoff with the objectives of providing controlled surface drainage, flood control, and pollutant reduction in runoff.

stormwater management system: All ditches, channels, conduits, bridges, culverts, levees, ponds, natural and man-made impoundments, wetlands, wetland buffers, riparian environment, tile, swales, sewers, BMPs or other natural or artificial structures or measures which serve as a means of draining surface and subsurface water from land.

Stormwater Permit: A permit established by this Ordinance and issued, through the City prior to the approval of a building permit signifying conformance with provisions of this Ordinance.

stream: A course of running water flowing in a channel (includes creeks and rivers).

structure: The results of a man-made change to the land constructed on or below the ground, including the construction, reconstruction, or placement of a building or any addition to a building; installing a manufactured homes on a site; preparing a site for a manufactured home; or installing a recreational vehicle on a site for more than 180 days.

Substantial damage: Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred. Such repairs may be undertaken successively and their costs counted cumulatively. Please refer to the definition of "substantial improvement."

substantial improvement: Any repair, reconstruction, addition, or improvement of a structure, the cost of which equals or exceeds 50% of the market value of the current structure either:

1. Before the improvements or repair is started; or
2. If the structure has been damaged, and is being restored, before the damage occurred. This term includes structures which have incurred a repetitive loss and for the purposes of this definition "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either:
  - a. Any project for improvement of a structure to comply with existing state or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions or;
  - b. Any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

***Permits shall be cumulative for a period of five years.*** If the improvement project is conducted in phases, the total of all costs associated with each phase, beginning with the issuance of the first permit, shall be utilized to determine whether "substantial improvement" will occur.

swale: A vegetated channel, ditch, or low-lying or depressional tract of land that is periodically inundated by conveying stormwater from one point to another.



Technical Reference Manual (TRM): The City of Greenville Technical Reference Manual. This manual contains design guidance for a development site to meet the Stormwater Ordinance performance standards.

transition section: Reaches of the stream or Regulatory Floodway where water flows from a narrow cross-section to a wide cross-section or vice-versa.

Undeveloped multi-residential and nonresidential property: Undeveloped property located within a zoning district in which multifamily, industrial, service or commercial uses are included as permitted uses.

Undeveloped residential property means undeveloped property: A district zoned primarily for detached single-family dwelling units and duplexes, but not including as permitted uses industrial, service and commercial uses.

usable space: Space used for dwelling, storage, utilities, or other beneficial purposes, including without limitations basements.

Violation: Failure of a structure or other development to be fully compliant with the regulations identified by Ordinance.

water dependent: Structures or facilities relating to the use of, or requiring access to, the water or shoreline. Examples of water dependent uses include, but are not limited to, pumping facilities, wastewater treatment facilities, facilities and improvements related to recreation boating or commercial shipping.

watershed: The land area above a given point on a channel that contributes stormwater to that point.

watershed benefit: A decrease in flood damages to structures or an improvement in water quality upstream or downstream of the development site created by installation of the stormwater management system. The benefit must be beyond the benefit provided by meeting the minimum Stormwater Ordinance standards and Technical Reference Manual guidance.

### Waters of the State:

1. All waters such as lakes, rivers, streams (including intermittent streams), mudflats, wetlands, sloughs, wet meadows, or natural ponds.
2. All impoundments of waters not otherwise defined as Waters of the State under the definition.
3. Tributaries of waters identified above.
4. Wetlands adjacent to waters identified above.

For clarification, waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Clean Water Act (other than cooling ponds as defined in 40 CFR 123.11(m) which also meet the criteria of this definition) are not Waters of the State. It should also be noted that the following waters are generally not considered to be Waters of the State.

1. Drainage and irrigation ditches excavated on dry land.
2. Artificially irrigated areas that would revert to upland if the irrigation ceased.

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## APPENDIX A: DEFINITIONS

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3. Artificial lakes created by excavating and/or diking dry land to collect and retain water and which are used exclusively for such purposes as stormwater storage, stock watering, irrigation, or settling basins.
4. Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating and/or diking dry land to retain water for primarily aesthetic reasons.
5. Water filled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of Waters of the State.

Waters of the United States: For the purpose of this Ordinance, the term Waters of the United States refers to those water bodies and wetland areas that are under the U. S. Army Corps of Engineers jurisdiction.

wet detention facility: A wet detention facility designed to maintain a permanent pool of water after the temporary storage of stormwater runoff.

wetland: Wetlands are land that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, under normal conditions, a prevalence of vegetation adapted for life in saturated soil conditions (known as hydrophytic vegetation). A wetland is identified based upon the three attributes: 1) hydrology, 2) soils, and 3) vegetation as mandated by the current Federal wetland determination methodology.

wetland impact: Waters of the U. S. or State that are hydrologically disturbed or otherwise adversely affected by flooding, filling, excavation, or drainage which results from implementation of a development activity.

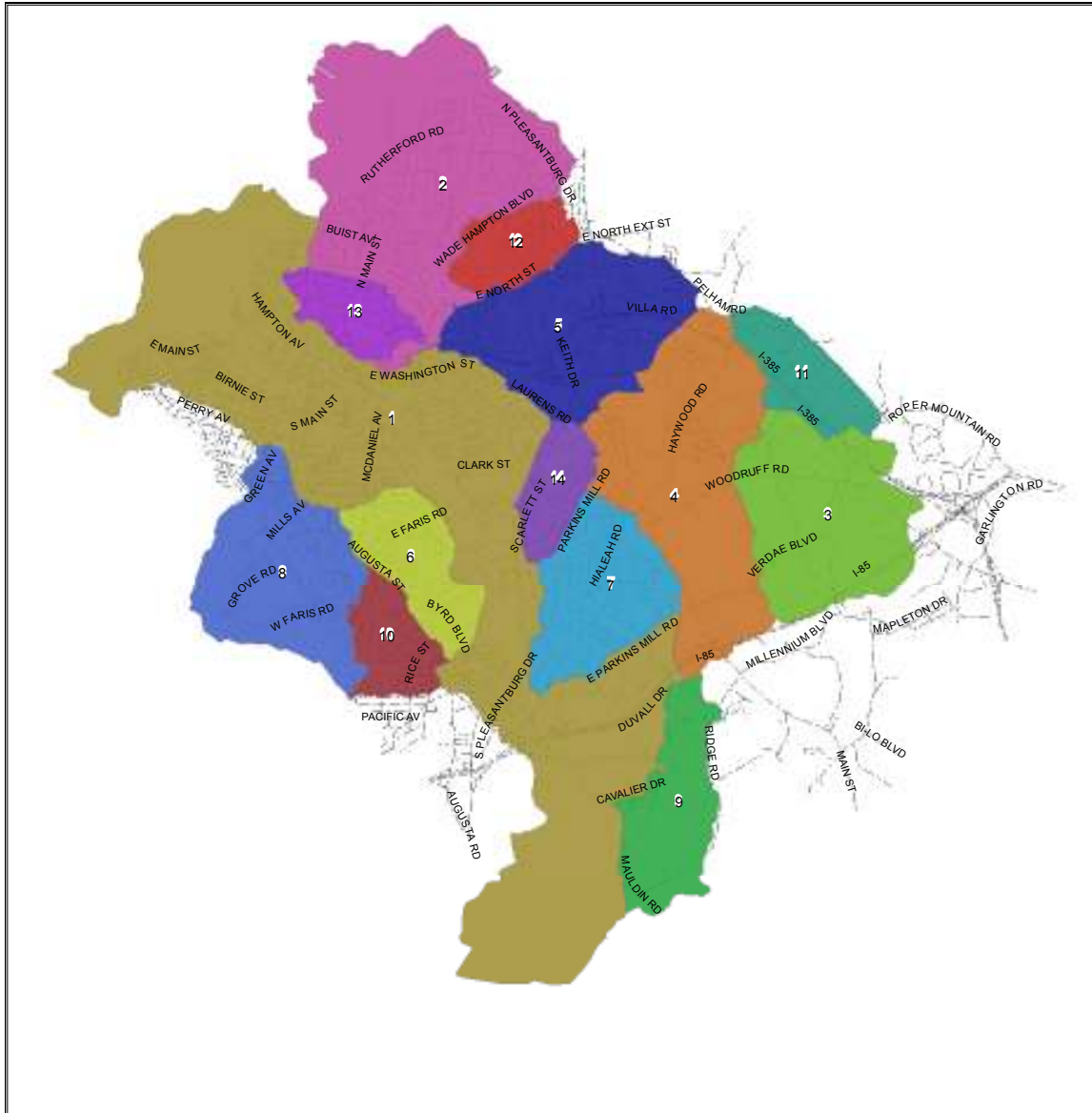
Wetland Scientist: Person meeting at least one of the following minimum requirements:

1. Registered Professional Wetland Scientist (PWS) from the Society of Wetland Scientists'.
2. Minimum of a Bachelor's Degree in an Earth Science or Biologic Science and at least one of the following: Three years (cumulative) full-time experience on wetland-related projects; or the completion of 50 wetland delineations; or a minimum of 100 hours spent in field review of wetlands.
3. Four years (cumulative) full-time experience on wetland-related projects.

## **APPENDIX B – CITY OF GREENVILLE REGULATORY FLOODPLAIN MAPS AND PROFILES**

<b>Waterway</b>	<b>Study Date</b>	<b>Description</b>
Reedy River (Basin 1)		
Dellwood / Chick Springs - Upper Richland Creek (Basin 2)	March 1999	Stormwater Master Plan, Hydrology, Hydraulics, Flood Profiles
Salters Road / Verdae Boulevard - East Laurel Creek (Basin 3)	March 2004	Stormwater Master Plan, Hydrology, Hydraulics, Flood Profiles
Laurel Creek / Haywood Road (Basin 4)	July 2001	Stormwater Master Plan, Hydrology, Hydraulics, Flood Profiles
Hidden Lake / Overbrook (Basin 5)	April 2002	Stormwater Master Plan, Hydrology, Hydraulics, Flood Profiles
Lanneau Drive / Pine Forest (Basin 6)	July 2001	Stormwater Master Plan, Hydrology, Hydraulics, Flood Profiles
Henderson Basin (Basin 7)	Revised 2006	Stormwater Master Plan, Hydrology, Hydraulics, Flood Profiles
Mills Avenue / West Faris Road - Brushy Creek (Basin 8)	February 2004	Stormwater Master Plan, Hydrology, Hydraulics, Flood Profiles
Fairforest Way (Basin 9)		
Meyers Drive / Waccamaw Avenue - Brushy Creek (Basin 10)	February 2004	Stormwater Master Plan, Hydrology, Hydraulics, Flood Profiles
Orchard Park / Patewood Rocky Creek (Basin 11)	March 2001	Stormwater Master Plan, Hydrology, Hydraulics, Flood Profiles
White Oak (Basin 12)	1991	Stormwater Master Plan
Park Avenue / Atwood (Basin 13)		
Sherwood Forest – Reedy River Tributary No. 3 (Basin 14)	November 1995	Stormwater Master Plan, Hydrology, Hydraulics, Flood Profiles
Fluor Daniel Site		Stormwater Master Plan

## APPENDIX B: CITY OF GREENVILLE REGULATORY FLOODPLAIN MAPS AND PROFILES



### Legend

- #2 Dellwood / Chicksprings
- #9 Fairforest Way
- #4 Haywood / Laurel Creek
- #7 Henderson
- #5 Hidden Lake / Overbrook
- #6 Lanneau Dr / Pine Forest
- #10 Meyers Dr / Waccamaw Av
- #8 Mills Av / W Faris Rd
- #11 Orchard Park / Patewood
- #13 Park Av / Atwood
- #1 Reedy River
- #3 Salters Rd / Verdae Blvd
- #14 Sherwood Forest
- #12 White Oak

**APPENDIX C – FEMA FLOOD INSURANCE STUDY MAPS AND PROFILES**

<b>Product Item ID</b>	<b>Item Name</b>	<b>Effective Date</b>
45045CV001A	FLOOD INSURANCE STUDY (FIS)	12/02/2004
45045CV002A	FLOOD INSURANCE STUDY (FIS)	12/02/2004
45045CV003A	FLOOD INSURANCE STUDY (FIS)	12/02/2004

<b>Panel Number</b>	<b>Item Name</b>	<b>Effective Date</b>
45045C0319D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045C0338D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045C0381D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045C0382D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045C0383D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045C0384D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045C0392D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045C0401D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045C0402D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045C0403D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045C0404D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045C0406D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045C0408D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045C0411D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045C0412D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045C0413D	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045CIND1A	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004
45045CIND2A	FLOOD INSURANCE RATE MAP (FIRM)	12/02/2004

**APPENDIX D: CITY OF GREENVILLE STORMWATER UTILITY RATES**

<b>Land Use Description</b>	<b>Fee Per Month</b>
Developed Residential (less than 1640 sq ft)	\$2.75
Developed Residential (greater than 1640 sq ft)	\$4.83
Undeveloped Residential	\$2.75
Developed Commercial/Industrial (Per ERU)	\$4.83
Undeveloped Commercial/Industrial	\$4.83

## **APPENDIX E - ADMINISTRATOR OR DESIGNEE DUTIES**

This Appendix, as a part of this duly adopted Ordinance, delineates requirements or duties required of its designated Administrator or designee. Certain requirements or duties specified by FEMA and DHEC are for the purposes of the City maintaining eligibility for participation in the National Flood Insurance Program and delegation of state permit authority. These certain requirements or duties relate only to the intergovernmental relationship between the City and FEMA or DHEC and they do not and are not intended to create any third party beneficial rights in or for applicants, property owners, or others.

- A. One of the primary duties of the Administrator or designee shall be to oversee the review all Stormwater Permit Applications and issue permits for those projects that are in compliance with the provisions of the Ordinance. The Administrator or designee shall be responsible for the administration and enforcement of this Ordinance.
- B. The Administrator or designee shall determine for each development if it is in a Special Flood Hazard Area (SFHA) using the criteria specified in Article IV, Section C.1 of this Ordinance. If a site is in a SFHA, a determination is required as to whether it is in a Regulatory Floodway, or a Regulatory Floodplain on which a detailed study has not been conducted, or a flood-prone area with a tributary drainage area equal to or greater than 640 acres, greater than 100 acres, or greater than 20 acres.
- C. The Administrator or designee shall ensure that a DHEC Dam Safety Permit is obtained or a letter stating that no Dam Safety Permit is required if the development includes a dam before the issuance of a Stormwater Permit.
- D. Adopted basin plans and floodplain studies may be the basis for more specific regulations. These additional or more specific regulations will apply only in the specific study area of the basin plan or floodplain study and supersede those of this Ordinance only upon amendment to the Stormwater Ordinance and formal adoption of the basin plan or floodplain study by the City.
- E. The Administrator or designee may require deed restrictions, performance bonds or sureties, as-built certification, or maintenance guarantees as stipulated in this Ordinance to assure projects are built and maintained according to permitted plans. If such performance bond or sureties or other such adequate security as the Administrator or designee may approve is required, the amount shall be equal to 110% of the estimated cost to complete construction of the stormwater management system required by the Stormwater Permit, which the estimated probable cost shall be approved by the Administrator or designee.
- F. A Registered Professional Engineer in the employ or under contract with the City shall review any plans, calculations, or analyses submitted by a Registered Professional Engineer pursuant to the requirements of this Ordinance.
- G. Proposed amendments to this Ordinance and appendices must be done in accordance with applicable state or federal law and approved by DHEC, SCDNR, and FEMA.
- H. Prior to the issuance of a Stormwater Permit, and based on the reliance that the application requirements of Article IV, Section B.2. have been met, the Administrator or designee shall further ensure that the applicant has obtained and provided copies of any and all required federal, state, and local permits for all development. Reference Appendix F for a partial list of permits that may be applicable.
- I. The Administrator or designee shall inspect (as defined in Appendix A of this Ordinance) all development projects before, during, and upon completion of construction to ensure proper elevation of the structure and to ensure compliance with the provisions of this Ordinance. The

## APPENDIX E: ADMINISTRATOR OR DESIGNEE DUTIES

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Administrator or designee may require a pre-construction meeting as a condition of issuing a permit.

J. Administrator or designee Duties

1. DHEC has retained permit review and approval authority all state, federal, and City development.
2. For the following types of regulatory approvals or permit authority, the City has jurisdiction within depressional flood-prone areas with greater than 20 acres of tributary area and riverine flood-prone areas with greater than 100 acres of tributary area. FEMA has jurisdiction within all Regulatory Floodways or Floodplains with greater than 640 acres (one square mile) of tributary area.
  - a. Base flood elevation determinations where none now exist
  - b. Any changes in the base flood elevation
  - c. Determination that the development is a public flood control project
  - d. City has regulatory approval or permit authority for the following types of development:
    - i. Determination that an existing bridge or culvert crossing proposed to be modified is not a source of flood damage and the analysis indicating the proposed flood profile, per Article IV, Section C.4.
    - ii. Alternative transition sections and hydraulically equivalent compensatory storage as indicated in Article IV, Section C.3.d.
    - iii. Other development as specified within intergovernmental agreements with the City of Greenville.

K. The Administrator or designee shall administer the submittal of the required data to the Federal Emergency Management Agency (FEMA) and the South Carolina Department of Natural Resources Land, Water and Conservation Division for proposed revisions to the base flood elevation of a Regulatory Floodplain study or a relocation of a Regulatory Floodway boundary.

The Administrator or designee shall submit reports as required for the National Flood Insurance Program.

L. The City will maintain a repository of stormwater management data for the City. Toward that end, the Administrator or designee shall:

1. Maintain records of every Stormwater Permit application, permit, variance, hydrologic and hydraulic data, and enforcement action and shall allow periodic inspections of the records by FEMA or DHEC personnel.
2. Maintain an elevation certificate and flood-proofing certificate file, to certify the elevation of the lowest floor (including basement) of a residential or non-residential building or the elevation to which a non-residential building has been flood-proofed, for all buildings constructed in the Regulatory Floodplain.



3. Maintain for public inspection and provide copies upon request of: base flood data and maps, variance documentation, Conditional Letters of Map Revision, Letters of Map Revision, Letters of Map Amendment, elevation and flood-proofing certificate, other Stormwater Permit related materials, elevation and flood-proofing record drawings for all buildings requiring flood-proofing or constructed subject to the elevation criteria provisions of this Ordinance, and record drawings of the stormwater management system required by this Ordinance for each development.

**APPENDIX F - PARTIAL LIST OF PERMITS REQUIRED (WHEN APPLICABLE) FOR  
DEVELOPMENT IN CITY OF GREENVILLE**

United States Army Corps of Engineers

South Carolina Department of Transportation

South Carolina Department of Health and Environmental Control

South Carolina Department of Natural Resources

Greenville Building Permits

State Historical Preservation Agency

United States Fish and Wildlife Service

## APPENDIX G - RAINFALL DEPTH DURATION FREQUENCY TABLES FOR CITY OF GREENVILLE

Precipitation Frequency Estimates (inches)																		
AEP* (1-in-Y)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	0.43	0.70	0.87	1.21	1.51	1.79	1.92	2.43	3.01	3.59	4.25	4.82	5.61	6.38	8.54	10.42	13.17	15.73
5	0.54	0.87	1.10	1.56	2.01	2.37	2.54	3.20	3.97	4.74	5.56	6.17	7.12	7.99	10.44	12.54	15.58	18.41
10	0.61	0.98	1.24	1.80	2.34	2.78	3.00	3.78	4.69	5.62	6.55	7.16	8.22	9.15	11.74	13.95	17.09	20.03
25	0.70	1.12	1.41	2.09	2.79	3.36	3.66	4.63	5.73	6.94	8.01	8.57	9.80	10.79	13.48	15.77	19.00	21.99
50	0.76	1.21	1.53	2.31	3.13	3.83	4.22	5.34	6.63	7.63	9.28	9.78	11.13	12.17	14.88	17.18	20.42	23.43
100	0.82	1.31	1.65	2.53	3.49	4.36	4.85	6.15	7.63	9.43	10.74	11.14	12.64	13.69	16.37	18.64	21.87	24.84
200	0.88	1.40	1.77	2.75	3.86	4.94	5.56	7.08	8.77	11.00	12.43	12.77	14.34	15.41	17.98	20.18	23.35	26.23
500	0.96	1.52	1.92	3.05	4.38	5.81	6.64	8.50	10.54	13.52	15.12	15.48	16.97	18.02	20.33	22.35	25.38	28.08
1000	1.03	1.62	2.03	3.29	4.80	6.57	7.60	9.77	12.13	15.84	17.57	17.96	19.31	20.31	22.28	24.13	26.98	29.50

\* These precipitation frequency estimates are based on an annual maxima series. AEP is the Annual Exceedance Probability for GREENVILLE, SOUTH CAROLINA (38-3732) from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 2, Version 3 G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley NOAA, National Weather Service, Silver Spring, Maryland, 2004, Extracted: Thu Feb 1 2007 unless otherwise noted.

## **APPENDIX H - WATERSHED SPECIFIC RELEASE RATES**

**Reserved.**